

حمل الآن

مجانا وحصريا

امتحانات رقم (1)

الترم الاول





First

Multiple choice questions (One mark for each question)

- (1) If f is an odd function and $f(3) = -2$ and the point $(-3, 5a - 13) \in$ the curve of function f , then $a = \dots\dots\dots$
- (a) 3 (b) 2 (c) $\frac{13}{5}$ (d) -2
- (2) $\lim_{x \rightarrow 1} \frac{\sqrt{x+8}-3}{x^2-1} = \dots\dots\dots$
- (a) $\frac{1}{2}$ (b) -4 (c) $\frac{1}{6}$ (d) $\frac{1}{12}$
- (3) The range of the function $f: f(x) = \frac{2x+1}{x-1}$ is $\dots\dots\dots$
- (a) $\mathbb{R} - \{1\}$ (b) $\mathbb{R} - \{-1\}$ (c) $\mathbb{R} - \{2\}$ (d) $\mathbb{R} - \{-2\}$
- (4) In $\triangle ABC$ $m(\angle A) = 120^\circ$, $b = 3$ cm. and $c = 5$ cm. , then the perimeter of $\triangle ABC = \dots\dots\dots$ cm.
- (a) 15 (b) 16 (c) 17 (d) 18
- (5) The solution set of the equation : $\sqrt{4x^2 - 12x + 9} = 7$
- (a) $\{2, 5\}$ (b) $\{-2, -5\}$ (c) $\{-2, 5\}$ (d) $\{2, -5\}$
- (6) $\lim_{x \rightarrow 0} \frac{1 - \cos x + \sin 3x}{1 + \tan 2x - \cos x} = \dots\dots\dots$
- (a) zero (b) $\frac{3}{2}$ (c) 1 (d) $\frac{4}{3}$
- (7) The solution set of the inequality : $|x - 2| > 3$ in $\mathbb{R}$ is $\dots\dots\dots$
- (a) $\mathbb{R} - [-1, 5]$ (b) $\mathbb{R} -]-1, 5[$ (c) $[-1, 5]$ (d) $] -1, 5[$
- (8) In $\triangle ABC$: $\frac{\sin A}{3} = \frac{2 \sin B}{5} = \frac{\sin C}{4}$, then $a : b : c = \dots\dots\dots$
- (a) $6 : 5 : 8$ (b) $8 : 5 : 6$ (c) $7 : 2 : 4$ (d) $3 : 5 : 4$
- (9) If $2^x = 7$ and $7^y = 16$, then $xy = \dots\dots\dots$
- (a) -4 (b) 7 (c) 8 (d) 4
- (10) If $f(x) = \log_2(x + k)$ and $f^{-1}(3) = 1$, then $k = \dots\dots\dots$
- (a) 4 (b) 5 (c) 6 (d) 7
- (11) If the area of triangle $ABC = 5 \text{ cm}^2$, then the value of $(a^2 + b^2 - c^2) \tan C = \dots\dots\dots$
- (a) 15 (b) 20 (c) 10 (d) 25

Second

Multiple choice questions (two marks for each question)

- (12) If $f(x) = x^3$ and $g(x) = x + 1$, then the function $(g \circ f)(x)$ will be :
 (a) odd (b) even (c) one-to-one (d) not one-to-one
- (13) In $\triangle ABC : a^2 = b^2 + c^2 - bc \cot A$, then $m(\angle A) \in \dots\dots\dots$
 (a) $\{30^\circ, 60^\circ\}$ (b) $\{30^\circ, 150^\circ, 90^\circ\}$
 (c) $\{60^\circ, 150^\circ\}$ (d) $\{30^\circ, 120^\circ\}$
- (14) If $f(x) = 3^x$, then the solution set in $\mathbb{R}$ of the equation : $f(x+1) - f(x-1) = 24$ is
 (a) 3 (b) 8 (c) zero (d) 2
- (15) $\lim_{x \rightarrow 2} \frac{(x+1)^4 - 81}{x^2 - 4} = \dots\dots\dots$
 (a) 3 (b) 9 (c) 27 (d) zero
- (16) The solution set of the equation : $\log(x+2) + \log(x-2) = \log 5$ in $\mathbb{R}$ is
 (a) $\{3\}$ (b) $\{3, -2\}$ (c) $\{1, 2\}$ (d) $\{5\}$
- (17) If $f(x) = \begin{cases} x+1 & , x > a \\ 3x-7 & , x < a \end{cases}$ and $\lim_{x \rightarrow a} f(x)$ is exist, then $a = \dots\dots\dots$
 (a) 2 (b) 4 (c) -4 (d) 8
- (18) $\lim_{x \rightarrow \infty} \frac{2x+3}{\sqrt{9x^2-25}} = \dots\dots\dots$
 (a) $\frac{2}{3}$ (b) $\frac{2}{9}$ (c) 2 (d) 3

Third

Essay questions

(19) If the function $f : f(x) = \begin{cases} x^2 + kx - 2 & , x > 2 \\ 4 & , x = 2 \\ 5k + mx & , x < 2 \end{cases}$

is continuous at $x = 2$, find the value of k, m

- (20) Represent the following function graphically $f(x) = 3 - x^2$ and from the graph determine the range, the type (odd, even, otherwise) and discuss its monotony.



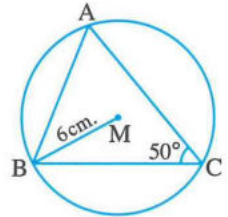
First

Multiple choice questions (One mark for each question)

(1) The shown figure is a circle of centre M

If : $BM = 6 \text{ cm.}$, $m(\angle C) = 50^\circ$, then $AB = \dots\dots\dots \text{ cm.}$

- (a) $6 \sin 50^\circ$ (b) $12 \sin 50^\circ$
(c) $6 \cos 50^\circ$ (d) $12 \cos 50^\circ$



(2) If : $f(x) = \sqrt{x+5}$, $g(x) = x^2$, then : $(f \circ g)(2) = \dots\dots\dots$

- (a) 7 (b) 3 (c) 4 (d) 9

(3) $\lim_{x \rightarrow \frac{1}{2}} \frac{4x^2 - 1}{32x^5 - 1} = \dots\dots\dots$

- (a) $\frac{2}{5}$ (b) $\frac{5}{2}$ (c) $\frac{2}{9}$ (d) $\frac{1}{8}$

(4) If : $f(x) = 3^x$, then the value of x which satisfies the equation :

$f(x+1) - f(x-1) = 24$ is $\dots\dots\dots$

- (a) 2 (b) 3 (c) 8 (d) 0

(5) $\lim_{x \rightarrow 3} \frac{\sqrt{x+1} - 2}{x-3} = \dots\dots\dots$

- (a) 4 (b) $\frac{1}{4}$ (c) 6 (d) $\frac{1}{6}$

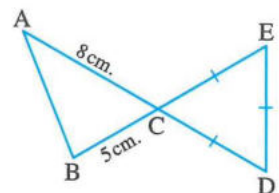
(6) In the opposite figure :

$CD = DE = EC$, $AC = 8 \text{ cm.}$,

$BC = 5 \text{ cm.}$, then :

$AB = \dots\dots\dots \text{ cm.}$

- (a) 6 (b) 7
(c) 8 (d) 9



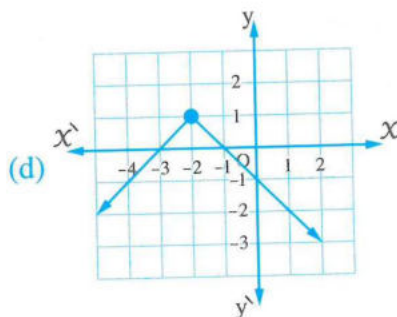
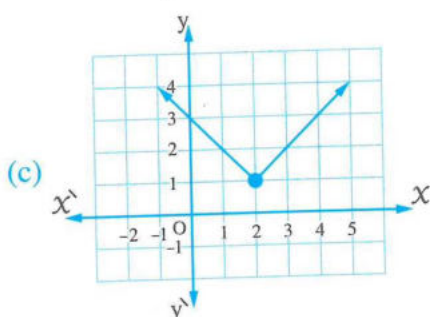
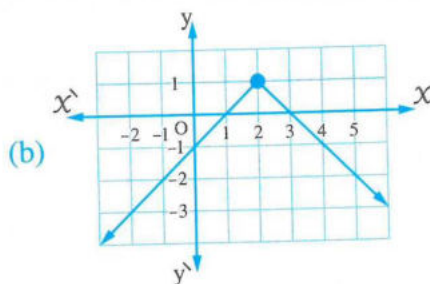
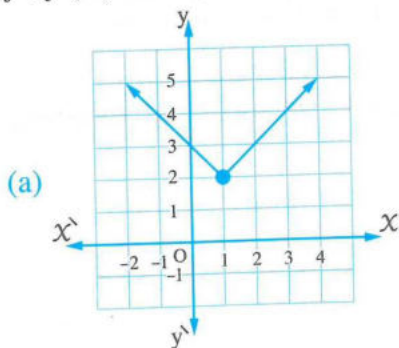
(7) In $\triangle ABC$: If $m(\angle A) + m(\angle B) = 120^\circ$, $a = 2 \text{ cm.}$,

$b = 3 \text{ cm.}$, then : $c = \dots\dots\dots \text{ cm.}$

- (a) 4 (b) 3 (c) $\sqrt{7}$ (d) $\sqrt{5}$

(8) Which of the following curves represents the function

$$f : f(x) = 1 - |x - 2| ?$$



(9) $\lim_{x \rightarrow -4} \frac{3x^2 - 48}{x + 4} = \dots\dots\dots$

- (a) 32 (b) -32 (c) 24 (d) -24

(10) If $f(x) = x^3 + 7$, then $f^{-1}(-1) = \dots\dots\dots$

- (a) 1 (b) 2 (c) -2 (d) 8

(11) The domain of the function f where $f(x) = \log(1 - x)^3$ is $\dots\dots\dots$

- (a) $]-\infty, 0[\cup]0, 1[$ (b) $]-\infty, 1[$ (c) $]1, \infty[$ (d) $]-1, 1[$

Second

Multiple choice questions (two marks for each question)

(12) The curve of the function $f : f(x) = \sin 3x$ is symmetric about the point $\dots\dots\dots$

- (a) (0, 0) (b) (3, 0) (c) (-3, 0) (d) (-3, 3)

(13) If the radius length of the circumcircle of ΔABC equals 4 cm.,

then $\frac{a + b + c}{\sin A + \sin B + \sin C} = \dots\dots\dots$

- (a) 4 (b) 2 (c) 8 (d) 16

(14) The solution set of the equation $\log_3 x - 2 \log_x 3 = 1$ in $\mathbb{R}$ is $\dots\dots\dots$

- (a) {8, 3} (b) $\{8, \frac{1}{3}\}$ (c) $\{9, \frac{1}{3}\}$ (d) {8}

(15) $\lim_{x \rightarrow \infty} \frac{x^3 + 5}{x(2x^2 + 3)} = \dots\dots\dots$

- (a) $\frac{5}{8}$ (b) 1 (c) $\frac{1}{2}$ (d) $\frac{5}{3}$

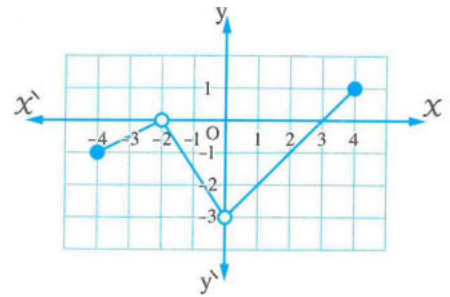
(16) The solution set of the inequality : $\sqrt{x^2 - 2x + 1} \geq 4$ is

- (a) $[-3, 5]$ (b) $\mathbb{R} -]-3, 5[$ (c) $] -3, 5[$ (d) $\mathbb{R} - [-3, 5]$

(17) From the opposite graph :

$\lim_{x \rightarrow -2} f(x) = \dots\dots\dots$

- (a) 0
(b) -3
(c) -2
(d) Does not exist



(18) Which of the following functions is one - to - one ?

- (a) $f(x) = 3 - x^2$ (b) $f(x) = x^3 + 3$
(c) $f(x) = \sin x \cdot \tan x$ (d) $f(x) = x^2 + x$

Third Essay questions

(19) Represent graphically the function : $f(x) = \begin{cases} x^2 + 1 & , x \leq 1 \\ 2 & , x > 1 \end{cases}$, then from the graph

deduce the range of the function and discuss its monotony.

(20) Find the values of : a , b which make the function :

$$f(x) = \begin{cases} 3x - 2 & , x \leq -2 \\ ax + b & , -2 < x < 5 \\ x^2 - 12 & , x \geq 5 \end{cases} \text{ is continuous on } \mathbb{R}$$

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Giza Governorate



6th October Educational
Mathematics Supervision

First Multiple choice questions (One mark for each question)

(1) If f is an even function and $7f(x) - 4f(-x) = 9$, then $f(x) = \dots\dots\dots$

- (a) -5 (b) 9 (c) 5 (d) 3

(2) $\log_b a^2 \times \log_c b \times \log_d c \times \log_a d = \dots\dots\dots$

- (a) 2 (b) 3 (c) 4 (d) 5

(3) In $\triangle XYZ$, if $\frac{\sin X}{3} = \frac{\sin Y}{4} = \frac{\sin Z}{5}$, then the greatest angle measure in the triangle equals

- (a) 60° (b) 75° (c) 90° (d) 120°

(4) If $f(x) = 3^{x-2}$, then the S.S. of the equation : $f(x-1) = 81$ in $\mathbb{R}$ is

- (a) $\{7\}$ (b) $\{5\}$ (c) $\{4\}$ (d) $\{3\}$

(5) The domain of the function $f(x) = \sqrt{x-5}$ is

- (a) $\mathbb{R}$ (b) $]-5, \infty[$ (c) $]-\infty, 5[$ (d) $[5, \infty[$

(6) If $f(x) = \begin{cases} \frac{(x+3)^5 - 243}{x} & , x \neq 0 \\ 3k & , x = 0 \end{cases}$ is continuous at $x = 0$, then $k = \dots\dots\dots$

- (a) 135 (b) 81 (c) 15 (d) 27

(7) In ΔABC , $a = 9$ cm., $b = 15$ cm., $m(\angle C) = 106^\circ$

, then its perimeter $\simeq \dots\dots\dots$ cm.

- (a) 44 (b) 24 (c) 34 (d) 28

(8) $\lim_{x \rightarrow 0} \frac{2x + \sin 3x}{5x + \tan 2x} = \dots\dots\dots$

- (a) -1 (b) 1 (c) $\frac{5}{7}$ (d) $\frac{7}{5}$

(9) The solution set of the inequality : $|2x - 5| \leq 9$ in $\mathbb{R}$ is

- (a) $]-\infty, 7[$ (b) $\mathbb{R} - [-2, 7]$ (c) $\mathbb{R} -]-2, 7[$ (d) $[-2, 7]$

(10) ABC is right-angled triangle at B and $b = 12$ cm., then $\frac{a}{\sin A} + \frac{c}{\sin C} = \dots\dots\dots$ cm.

- (a) 6 (b) 12 (c) 24 (d) 36

(11) If $f(x) = \sqrt{x+5}$, $g(x) = x^2$, then $(f \circ g)(2) = \dots\dots\dots$

- (a) 3 (b) 4 (c) 7 (d) 9

Second

Multiple choice questions (two marks for each question)

(12) $\lim_{x \rightarrow 3} \frac{\sqrt{x+1} - 2}{x-3} = \dots\dots\dots$

- (a) 4 (b) $\frac{1}{4}$ (c) 6 (d) $\frac{1}{6}$

(13) $\lim_{x \rightarrow \infty} \frac{x^{-3} + x^{-2} + 8}{2 - x^{-4} + x^{-3}} = \dots\dots\dots$

- (a) 1 (b) 4 (c) ∞ (d) $-\infty$

(14) $\lim_{x \rightarrow -2} \frac{x^7 + 128}{x^4 - 16} = \dots\dots\dots$

- (a) 9 (b) -9 (c) -14 (d) 14

(15) If the function $f = \{(1, 4), (2, -3), (3, 1), (4, 0)\}$, then $f^{-1}(1) + f(2) = \dots\dots\dots$

- (a) -1 (b) zero (c) 1 (d) 3

(16) If $\log_x 25 = 2$, then $x^3 + x^2 - x = \dots\dots\dots$

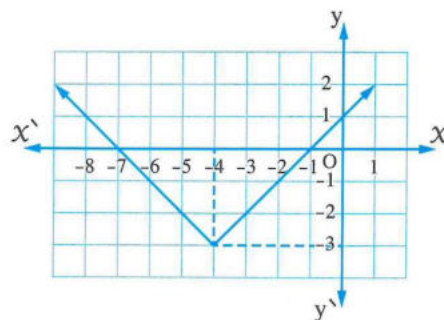
- (a) 105 (b) 95 (c) 155 (d) 145

(17) The radius length of the circumcircle of an equilateral triangle whose side length is $20\sqrt{3}$ cm. = $\dots\dots\dots$

- (a) 5 (b) 10 (c) 20 (d) 40

(18) Which of the following function rules represents the curve in the given figure ?

- (a) $f(x) = |x - 4| - 3$
 (b) $f(x) = |x - 4| + 3$
 (c) $f(x) = |x + 4| - 3$
 (d) $f(x) = |x + 4| + 3$



Third Essay questions

(19) Graph the curve of function $f : f(x) = (x - 1)^2 + 2$, then from the graph find :

- (1) The domain.
 (2) Determine the function is odd, even or otherwise.

(20) If $f(x) = \begin{cases} \frac{x^2 - 7x + 12}{x - 3} & , x > 3 \\ 2x - 7 & , x < 3 \end{cases}$ discuss the existence of $\lim_{x \rightarrow 3} f(x)$

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Alexandria Governorate



East Educational Zone

First Multiple choice questions (One mark for each question)

(1) The solution set of the equation $|3 - 2x| < 1$, in $\mathbb{R}$ is $\dots\dots\dots$

- (a) $]1, 2[$ (b) $[1, 2]$ (c) $\mathbb{R} -]1, 2[$ (d) $\mathbb{R} - [1, 2]$

(2) $\lim_{x \rightarrow 2} \frac{\sqrt{x+2} - 2}{x - 2} = \dots\dots\dots$

- (a) 4 (b) $\frac{1}{4}$ (c) $-\frac{1}{4}$ (d) -4

(3) The range of the function $f(x) = \frac{1}{x-1} - 3$ is $\dots\dots\dots$

- (a) $\mathbb{R} - \{3\}$ (b) $\mathbb{R} - \{2\}$ (c) $\mathbb{R} - \{-3\}$ (d) $\mathbb{R} - \{-2\}$

(4) If $y = \sqrt[5]{x}$, then its inverse function $f^{-1}(x) = \dots\dots\dots$

- (a) $\frac{1}{5} x^5$ (b) $x^5 - 1$ (c) x^5 (d) $5 x^5$

(5) In $\triangle ABC$: $\cos (A + B) = \dots\dots\dots$

- (a) $\cos C$ (b) $\cos A + \cos B$ (c) $\sin A + \sin B$ (d) $-\cos C$

(6) The domain of the function : $f(x) = \sqrt{8 - 4x}$ $\dots\dots\dots$

- (a) $[2, \infty[$ (b) $] -\infty, -2[$ (c) $] -\infty, 2[$ (d) $] -2, \infty[$

(7) $\lim_{x \rightarrow 0} \frac{3x^2}{2 \sin^2 x} \dots\dots\dots$

- (a) $\frac{3}{2}$ (b) $\frac{9}{4}$ (c) 1 (d) $\frac{9}{2}$

(8) In $\triangle ABC$: if, $a = b = 5$ cm. , $m(\angle A) = 70^\circ$, then the area of $\triangle ABC \simeq \dots\dots\dots \text{cm}^2$

- (a) 8 (b) 12 (c) 11 (d) 25

(9) $\lim_{x \rightarrow 4} \frac{(x-1)^4 - 81}{x-4} \dots\dots\dots$

- (a) 108 (b) 4 (c) 36 (d) $\frac{81}{4}$

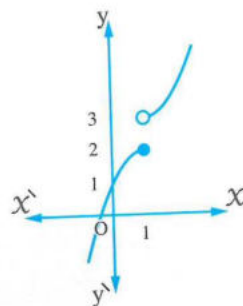
(10) In $\triangle ABC$, $a^2 + 2bc \cos A = \dots\dots\dots$

- (a) $a^2 + b^2$ (b) $a^2 + c^2$
(c) $b^2 + c^2$ (d) $a^2 + b^2 + c^2$

(11) In the opposite figure :

$\lim_{x \rightarrow 1} f(x) = \dots\dots\dots$

- (a) 1
(b) 3
(c) does not exist
(d) 2



Second

Multiple choice questions (two marks for each question)

(12) $\lim_{x \rightarrow \infty} \frac{3a^{\frac{1}{x}}}{7} = \dots\dots\dots$ (Where $a \neq 0$)

- (a) zero (b) $\frac{3a}{7}$ (c) $3a$ (d) $\frac{3}{7}$

(13) $\lim_{2x \rightarrow -a} \frac{32x^5 + a^5}{8x^3 + a^3} = 45$, then $a = \dots\dots\dots$

- (a) 6 (b) 27 (c) $\pm 3\sqrt{3}$ (d) ± 27

(14) If $5^{x-3} = 4^{3-x}$, then $x = \dots\dots\dots$

- (a) $\frac{5}{4}$ (b) 3 (c) $\frac{4}{5}$ (d) zero

(15) If $\log (X + 11) = 2$, then $X = \dots\dots\dots$

- (a) -9 (b) 22 (c) 89 (d) 91

(16) In ΔABC , then $\frac{a}{4 \sin A} = \dots\dots\dots r$ (radius of its circumcircle)

- (a) 4 (b) 2 (c) 1 (d) $\frac{1}{2}$

(17) If the function : $f (X) = X + 1$, $g (X) = X^2$, then $(g \circ f) (1) = \dots\dots\dots$

- (a) 1 (b) 4 (c) 2 (d) 11

(18) If $\log A = 2$, $\log B = 6$, then $\log (AB) = \dots\dots\dots$

- (a) 12 (b) 3 (c) 8 (d) 4

Third Essay questions

(19) Graph the function $f : \mathbb{R} \longrightarrow \mathbb{R}$, $f (X) = 2 - \frac{1}{X-2}$, and from the graph , deduce the range of the function and its monotonicity.

(20) If the function $f : f (X) = \begin{cases} \frac{X^2 + 2X - 3}{X + 3} & , \quad X \neq -3 \\ X + a & , \quad X = -3 \end{cases}$ is continuous at $X = -3$, then find a

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El-Kalyoubia Governorate



Mathematics Inspection

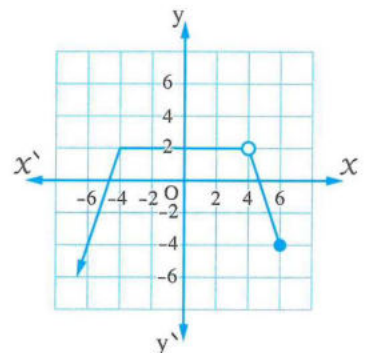
First

Multiple choice questions (One mark for each question)

(1) In the opposite figure :

The domain is

- (a) $]-\infty , 6]$
 (b) $]-\infty , 6] - \{4\}$
 (c) $]-\infty , 6] - \{2\}$
 (d) $]-\infty , 2]$



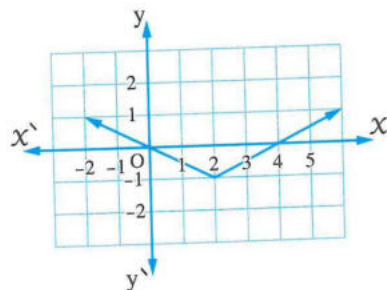
(2) Which of the following is even function ?

- (a) $(2 + X)^2$ (b) $(2 - X)^2$ (c) $2 - X^2$ (d) $(X - 3)^2$

(3) In the opposite figure :

The rule of the function is

- (a) $|x - 2|$
- (b) $|x - 2| - 1$
- (c) $\frac{1}{2} |x - 2| - 1$
- (d) $2 |x - 2| - 1$



(4) If the function $f : f$ is one - to - one function , $f(2k + 3) = f(k - 1)$, then $k =$

- (a) -1
- (b) -2
- (c) -3
- (d) -4

(5) If $f(x) = x^3 - 1$, then $f^{-1}(7) =$

- (a) 2
- (b) ± 2
- (c) 342
- (d) 3

(6) If the point A (4 , 30) belongs to the curve of the function , $f(x) = \left(\frac{1}{5}\right)^{x-6} + k$, then $k =$

- (a) 35
- (b) 5
- (c) 6
- (d) 60

(7) $\lim_{x \rightarrow 0} \frac{\tan 2x^2 - 3 \sin^2 x}{x^2} =$

- (a) -2
- (b) 2
- (c) 1
- (d) -1

(8) $\lim_{x \rightarrow 3} \frac{\sqrt{x+1} - 2}{x-3} =$

- (a) 2
- (b) $\frac{1}{2}$
- (c) $\frac{1}{4}$
- (d) 4

(9) $\lim_{x \rightarrow 0} \frac{x^2 - x}{x} =$

- (a) 1
- (b) -1
- (c) 0
- (d) has no limit

(10) In $\triangle ABC$ if : $a = 3$ cm. , $b = 6$ cm, $c = 8$ cm. , then $m(\angle B) =$ °

- (a) 40
- (b) 90
- (c) 41
- (d) 60

(11) $\triangle ABC$ if $\frac{b+c}{11} = \frac{c+a}{10} = \frac{a+b}{15}$, then $\sin A : \sin B : \sin C$

- (a) 7 : 8 : 3
- (b) 8 : 7 : 3
- (c) 3 : 8 : 7
- (d) 3 : 7 : 8

Second

Multiple choice questions (two marks for each question)

(12) The solution set of the inequality $|3x - 2| > 4$ in $\mathbb{R}$ is

- (a) $\mathbb{R} - \left] \frac{2}{3}, 2 \right[$
- (b) $\mathbb{R} - \left[\frac{2}{3}, 2 \right]$
- (c) $\mathbb{R} - \left] \frac{2}{3}, 2 \right[$
- (d) $\mathbb{R} - \left[\frac{2}{3}, 2 \right]$

(13) The solution set of the equation : $(3x - 2)^{\frac{3}{4}} = 8$ in $\mathbb{R}$ is

- (a) $\{6, -6\}$
- (b) $\{6\}$
- (c) $\{0\}$
- (d) $\{18\}$

(14) If $7^{\log X} = 2^{\log 7}$, then $X = \dots\dots\dots$

- (a) 2 (b) 7 (c) 2^7 (d) 7^2

(15) $\lim_{x \rightarrow 0} (1 - \cos x) \cot x = \dots\dots\dots$

- (a) 0 (b) 1 (c) -1 (d) has no limit

(16) $\lim_{x \rightarrow \infty} \left(\frac{x^2 + 4}{x + 6} - \frac{x^2 - 3x}{x + 6} \right) = \dots\dots\dots$

- (a) 3 (b) $-\frac{1}{2}$ (c) ∞ (d) 0

(17) $\lim_{x \rightarrow -1} \left(\frac{x^9 + 1}{x^5 + x^2} \right) = \dots\dots\dots$

- (a) 3 (b) -1 (c) 0 (d) has no limit

(18) In the triangle ABC in which : $b = 2c$, $a = 7$ cm. and $\cos A = -\frac{1}{9}$, then $c = \dots\dots\dots$ cm.

- (a) 3 (b) 6 (c) 4 (d) 5

Third Essay questions

(19) If f and g are two polynomial functions, and if $f(x) = g(x)$, given that :

$f(x) = (2a - 8)x^3 + 5x^2 - x + c$, $g(x) = (a + b)x^2 + cx - k + 3$, then find the value of $ab + ck$

(20) Discuss the continuity of the function $f : f(x) = \begin{cases} 3x + 7 & \text{when } -4 < x \leq -1 \\ 4 & \text{when } -1 < x \leq 2 \\ x^2 - 3 & \text{when } 2 < x < 4 \end{cases}$ on the interval $]-4, 4[$

6

El-Sharkia Governorate



Montazah Zone

First Multiple choice questions (One mark for each question)

(1) $\lim_{x \rightarrow 0} \frac{2x + \sin 3x}{\tan 5x}$

- (a) zero (b) 1 (c) 5 (d) $\frac{6}{5}$

(2) The solution set in $\mathbb{R}$ of the equation : $\log_2 x + \log_2 (x + 1) = 1$ is $\dots\dots\dots$

- (a) $\{1, -1\}$ (b) $\{1, -2\}$ (c) $\{1\}$ (d) $\{0\}$

(3) From the following, $f(x) = \dots\dots\dots$ is neither odd nor even.

- (a) $\sin x$ (b) $\sin 30$ (c) $x \cos x$ (d) $x^2 + \tan x$

(4) The measure of the greatest angle in the triangle whose side lengths are : 5 cm. , 13 cm. and 12 cm. is

- (a) $\frac{\pi}{4}$ (b) $\frac{\pi}{2}$ (c) $\frac{2}{3} \pi$ (d) $\frac{\pi}{6}$

(5) $\lim_{x \rightarrow 1} \frac{1}{(x-1)^2} = \dots\dots\dots$

- (a) 1 (b) 51 (c) zero (d) ∞

(6) The solution set in $\mathbb{R}$ of the equation : $|2x - 3| = |x + 2|$ is

- (a) $\{5, 3\}$ (b) $\{5, \frac{1}{3}\}$ (c) $\{\frac{3}{2}\}$ (d) $\{-2\}$

(7) The range of the equation $f : f(x) = \frac{x^2 - 4}{x - 2}$ is

- (a) $\mathbb{R}$ (b) $\mathbb{R} - \{0\}$ (c) $\mathbb{R} - \{4\}$ (d) $\mathbb{R} - \{2\}$

(8) $\lim_{x \rightarrow 1} \frac{(x+1)^5 - 32}{x-1} = \dots\dots\dots$

- (a) 160 (b) 165 (c) 80 (d) 16

(9) The solution set in $\mathbb{R}$ of the equation : $4^x + 2^{x+1} = 8$ are

- (a) $\{1\}$ (b) $\{1, -1\}$ (c) $\{1, -2\}$ (d) $\emptyset$

(10) If the point $(k^2 - 3, 1)$ is the point of intersection between the function f and its inverse function f^{-1} , then $k = \dots\dots\dots$

- (a) 4 (b) ± 2 (c) ± 4 (d) $\pm \sqrt{3}$

(11) $\lim_{x \rightarrow \infty} \frac{(x+1)(5x-2)}{x^2+3} = \dots\dots\dots$

- (a) 3 (b) 5 (c) ∞ (d) not exists

Second

Multiple choice questions (two marks for each question)

(12) The curve of the function $g : g(x) = x^2 - 4$, is the same curve of the function $f : f(x) = x^2$ by a translation 4 units in the direction of

- (a) $\overrightarrow{OX}$ (b) $\overrightarrow{O\bar{X}}$ (c) $\overrightarrow{oy}$ (d) $\overrightarrow{oy}$

(13) The point of symmetry of the graph of the function f , where : $f(x) = (x-1)^3 + 2$ is

- (a) $(-1, 2)$ (b) $(2, -1)$ (c) $(-1, -2)$ (d) $(1, 2)$

(14) If $\frac{\sin A}{3} = \frac{2 \sin B}{5} = \frac{\sin C}{4}$, then $a : b : c = \dots\dots\dots$

- (a) 6 : 5 : 8 (b) 8 : 5 : 6 (c) 7 : 2 : 4 (d) 3 : 5 : 4

(15) If $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2}$ exists, then $a = \dots\dots\dots$

- (a) 4 (b) 2 (c) -1 (d) 1

(16) The expression $\frac{3 \log 2}{\log 4 + \log 3}$ is equivalent to the expression $\dots\dots\dots$

- (a) $\log_7 2$ (b) $\log_3 2$ (c) $\log_7 8$ (d) $\log_{12} 8$

(17) $\lim_{x \rightarrow 0} \frac{\sin x}{x} = \dots\dots\dots$, where x is in degree measure.

- (a) 1 (b) $\frac{\pi}{180}$ (c) $\frac{180}{\pi}$ (d) π

(18) In the triangle ABC, $a^2 + b^2 - c^2 = \dots\dots\dots$

- (a) $2 ac \cos B$ (b) $ac \cos B$ (c) $ab \cos C$ (d) $2 ab \cos C$

Third

Essay questions

(19) Find : $\lim_{x \rightarrow -2} \frac{(x+3)^5 - 1}{x^2 - 4}$

(20) Find in $\mathbb{R}$ the solution set of the inequality : $|3x - 2| \geq 7$

7

El-Monofia Governorate



Shbeen El-kom Educational Zone
Math supervision

First

Multiple choice questions (One mark for each question)

(1) If $f(3) = 5$, $2g(-1) = 6$, then $(f \circ g)(-1) = \dots\dots\dots$

- (a) 3 (b) 11 (c) 15 (d) 5

(2) The solution set of inequality $|x + 2| < 6$ in $\mathbb{R}$ is $\dots\dots\dots$

- (a) $]-8, 4[$ (b) $\mathbb{R} -]-8, 4[$ (c) $\mathbb{R} - \{-8, 4\}$ (d) $\mathbb{R} - [-8, 4]$

(3) The domain of $f(x) = \frac{x}{|x| + a}$ is $\mathbb{R} - \{3, -3\}$, then $a = \dots\dots\dots$

- (a) 3 (b) ± 3 (c) -3 (d) zero

(4) If the function $f(x)$ is an odd function, then the value of expression :

$$\frac{5f(x) - 4f(-x)}{3f(-x)} = \dots\dots\dots$$

- (a) 3 (b) -3 (c) 5 (d) -4

(5) The solution set of equation $|x| + 7 = 5$ in $\mathbb{R}$ is $\dots\dots\dots$

- (a) $\{-2\}$ (b) $\{12\}$ (c) $\emptyset$ (d) $\{2\}$

(6) If $3^{x-2} = 5^{x-2}$, then $5^x = \dots\dots\dots$

(a) 25

(b) 5

(c) 125

(d) 2

(7) The inverse function of $y = 2x + 1$ is $\dots\dots\dots$

(a) $x = y + 1$

(b) $y = 2x + 1$

(c) $y = \frac{1}{2}x - 1$

(d) $y = \frac{1}{2}(x - 1)$

(8) If $\log_y x = \frac{2}{3}$, then $\log_x y = \dots\dots\dots$

(a) 6

(b) $\frac{1}{6}$

(c) 5

(d) $\frac{3}{2}$

(9) $\frac{\log 500 - \log 5}{\log_{xy} x + \log_{xy} y} = \dots\dots\dots$

(a) 10

(b) 5

(c) 2

(d) 1

(10) $\lim_{x \rightarrow 2} \frac{x^2 - 6x + 8}{x^2 - 5x + 6} = \dots\dots\dots$

(a) 2

(b) 3

(c) -1

(d) 4

(11) If $f(x) = \begin{cases} \frac{\tan 3x}{x} & , x > 0 \\ 2 + \cos x & , x \leq 0 \end{cases}$, then $\lim_{x \rightarrow 0} f(x) = \dots\dots\dots$

(a) 2

(b) $\frac{3}{2}$

(c) 4

(d) 3

Second

Multiple choice questions (two marks for each question)

(12) $\lim_{x \rightarrow 0} \frac{\tan^2 2x \cos 5x}{\sin 2x^2} = \dots\dots\dots$

(a) 10

(b) 2

(c) 5

(d) 1

(13) $\lim_{x \rightarrow \infty} \frac{3 + x^{-2}}{4x^{-3} + 1} = \dots\dots\dots$

(a) $\frac{3}{5}$

(b) $\frac{3}{4}$

(c) 3

(d) $\frac{1}{3}$

(14) If $f : f(x) = \begin{cases} \frac{x^2 - 3x - 18}{x + 3} & , x \neq -3 \\ 9k & , x = -3 \end{cases}$ is continuous at $x = -3$, then $k = \dots\dots\dots$

(a) -1

(b) 1

(c) 3

(d) -3

(15) If $\triangle ABC$ if $\frac{\sin A}{3} = \frac{2 \sin B}{5} = \frac{\sin C}{4}$, then $a : b : c = \dots\dots\dots$

(a) 6 : 5 : 8

(b) 8 : 5 : 6

(c) 7 : 2 : 4

(d) 3 : 5 : 4

(16) In $\triangle XYZ$ if $x = 6$ cm., $y = 4$ cm., $\cos Z = \frac{1}{3}$, then $z = \dots\dots\dots$ cm.

(a) 3

(b) 4

(c) 5

(d) 6

(17) The measure of greatest angle in triangle whose sides length 6 cm. , 10 cm. , 14 cm equal°

- (a) 120 (b) 150 (c) 135 (d) 90

(18) ΔABC in which $a = 8$ cm. , $m(\angle B) = 50^\circ$, $m(\angle A) = 60^\circ$, then the surface area of $\Delta ABC \approx$ cm^2 .

- (a) 56 (b) 24 (c) 27 (d) 48

Third Essay questions

(19) Draw the curve of $f(x) = \frac{1}{x-2} + 3$, then from the graph deduce the domain , range of the function and its monotony.

(20) If $f(x) = \begin{cases} \frac{(x+2)^5 - 32}{x} & , \quad x \neq 0 \\ 5k & , \quad x = 0 \end{cases}$ is continues at $x = \text{zero}$, find the value of k ?

8

El-Gharbia Governorate



Mathematics Inspection

First Multiple choice questions (One mark for each question)

(1) If $f(x) = 5x + 4$ and $g(x) = \sqrt{25 - x^2}$, then $(f \circ g)(4) =$

- (a) 9 (b) 19 (c) 25 (d) 27

(2) The solution set of the inequality $|x + 7| < 5$ in $\mathbb{R}$ is

- (a) $\mathbb{R}$ (b) $]-7, 5[$ (c) $[-12, -2]$ (d) $]-12, -2[$

(3) The solution set of the equation $\sqrt{x^2 + 6x + 9} = 5$ in $\mathbb{R}$ is

- (a) $\{3, 4\}$ (b) $\{-5\}$ (c) $\emptyset$ (d) $\{-8, 2\}$

(4) If f is an even function and $7f(x) - 4f(-x) = 9$, then $f(x) =$

- (a) -5 (b) 9 (c) 5 (d) 3

(5) Which of the following is one-to-one function on $\mathbb{R}$.

- (a) $\cos x$ (b) x^2 (c) x^3 (d) $x^4 + x^2$

(6) $\lim_{x \rightarrow 2} \frac{x^5 - 32}{x^3 - 8} =$

- (a) 4 (b) $\frac{5}{3}$ (c) 0 (d) $6\frac{2}{3}$

(7) $\lim_{x \rightarrow 3} \frac{\sqrt{x+1} - 2}{x-3} =$

- (a) 4 (b) $\frac{1}{4}$ (c) 6 (d) $\frac{1}{6}$

(8) $\lim_{x \rightarrow \infty} \left(\frac{x^2 + 5x}{x+3} - \frac{x^2 + 1}{x+3} \right) = \dots\dots\dots$

(a) $\frac{5}{3}$

(b) $\frac{1}{3}$

(c) 5

(d) -5

(9) $\lim_{x \rightarrow 0} \frac{\tan 2x^2 + \sin^2 x}{x^2} = \dots\dots\dots$

(a) 3

(b) 5

(c) zero

(d) 4

(10) The solution set of the equation : $2^{x+1} + 2^{x-1} = 10$ in $\mathbb{R}$ is $\dots\dots\dots$

(a) $\{-2, 2\}$

(b) $\{2\}$

(c) $\{4\}$

(d) $\{1, -4\}$

(11) $\log_7 25 \times \log_6 7 \times \log_5 6 = \dots\dots\dots$

(a) 3

(b) 4

(c) $\log_4 16$

(d) $\log_3 6$

Second

Multiple choice questions (two marks for each question)

(12) If $f(x) = 2x - 6$, then its inverse function $f^{-1}(x) = \dots\dots\dots$

(a) $2x + 6$

(b) $x + 3$

(c) $2x + 3$

(d) $\frac{1}{2}x + 3$

(13) $\log(\cos x) + \log(\sec x) = \dots\dots\dots$ where $x \in \left[0, \frac{\pi}{2}\right]$

(a) -1

(b) 0

(c) 1

(d) 5

(14) If $\lim_{x \rightarrow \infty} \frac{3kx}{4x+3} = 6$, then $k = \dots\dots\dots$

(a) $\frac{3}{4}$

(b) 6

(c) 8

(d) 3

(15) In any ΔXYZ if $x = y$, then $\cos X = \dots\dots\dots$

(a) $\frac{2y^2}{z}$

(b) $\frac{z}{2y}$

(c) $\frac{z}{4x}$

(d) $\frac{y}{2x}$

(16) In any ΔXYZ if $m(\angle X) : m(\angle Y) : m(\angle Z) = 1 : 2 : 3$, $x = 12$ cm., then area of $\Delta XYZ = \dots\dots\dots \text{cm}^2$

(a) 72

(b) $72\sqrt{3}$

(c) 144

(d) $144\sqrt{3}$

(17) In ΔABC in which $m(\angle A) = 30^\circ$, $a = 10$ cm., then the radius length of the circumcircle of $\Delta ABC = \dots\dots\dots$ cm.

(a) 5

(b) 10

(c) 20

(d) 40

(18) In ΔABC in which $a = 5$ cm., $b = 7$ cm. and $c = 8$ cm., then $m(\angle B) = \dots\dots\dots^\circ$

(a) 30

(b) 45

(c) 60

(d) 90

Third**Essay questions**

- (19) Graph the function $f : f(x) = \begin{cases} |x| & , x \leq 0 \\ x^2 & , x > 0 \end{cases}$, from the graph state the range of the function, discuss its monotony, determine whether the function is even, odd or otherwise and is it one-to-one.

- (20) Discuss the continuity of $f : f(x) = \begin{cases} 4x - 1 & , x \leq 1 \\ x^2 + 2 & , x > 1 \end{cases}$ at $x = 1$

9**El-Dakahlia Governorate****Maths supervision****First****Multiple choice questions (One mark for each question)**

- (1) The range of the function $f(x) = 5 - (x - 3)^2$ is
- (a) $]-\infty, 5]$ (b) $\mathbb{R}$ (c) $\mathbb{R} - \{5\}$ (d) $[5, \infty[$
- (2) The domain of the function $f(x) = \sqrt{x^2 - 3}$ is
- (a) $\mathbb{R} -]-3, 3[$ (b) $] -3, 3[$ (c) $[-3, 3]$ (d) $\mathbb{R} - [-3, 3]$
- (3) If the function f is an odd function its domain is $\mathbb{R}$, then the value of $\frac{9f(-5) + 3f(5)}{2f(-5)}$ is
- (a) $3f(5)$ (b) 3 (c) 6 (d) $-3f(5)$
- (4) The two functions f, g each of them is the inverse function of the other where $f(x) = 3x + a$, $g(x) = bx + 3$, then the value of $3b + a$ is
- (a) -8 (b) 9 (c) 8 (d) -9
- (5) If the symmetrical point of the function $f(x) = \frac{1}{x+a} + 3$ is $(-4, 3)$, then $a = \dots\dots\dots$
- (a) -4 (b) 3 (c) 4 (d) -3
- (6) If L, M are two roots of the equation $3x^2 - 16x + 24 = 0$, then the value of $\log_2 L + \log_2 M = \dots\dots\dots$
- (a) 24 (b) 18 (c) 8 (d) 3
- (7) $\log 5 = X$, $\log 4 = Y$, then $\log 20 = \dots\dots\dots$
- (a) $X + Y$ (b) XY (c) $\log X + \log Y$ (d) $\log XY$

(8) Number of roots of the equation $x^3 = -8$ in $\mathbb{R}$ is

- (a) 1 (b) 3 (c) 2 (d) 5

(9) If the curve of $y = \log_4(1 - ax)$ passing through the point $(\frac{1}{4}, -\frac{1}{2})$, then $3a = \dots\dots\dots$

- (a) 4 (b) 8 (c) 2 (d) 6

(10) ΔABC right at B and $b = 15$ cm. , then $\frac{a}{\sin A} + \frac{c}{\sin C} = \dots\dots\dots$

- (a) 40 (b) 20 (c) 10 (d) 30

(11) ΔABC , $a = 16.82$ cm. , $b = 5.6$ cm. , $c = 12$ cm.

, then area of $\Delta ABC \approx \dots\dots\dots \text{cm}^2$

- (a) 26.88 (b) 40.32 (c) 20.15 (d) 60.48

Second

Multiple choice questions (two marks for each question)

(12) ΔABC its area 24 cm^2 , length of radius of its circumcircle is 6 cm.

, then $\sin A \times \sin B \times \sin(A + B) = \dots\dots\dots$

- (a) $\frac{2}{3}$ (b) $\frac{1}{3}$ (c) $\frac{1}{6}$ (d) $\frac{5}{6}$

(13) If the length of the radius of the circumcircle of ΔABC is x cm. , then $\frac{5c}{\sin C} = \dots\dots\dots \text{cm}$.

- (a) $5x$ (b) $15x$ (c) $10x$ (d) $20x$

(14) $\lim_{x \rightarrow 0} \frac{(4x+1)^{12} - 1}{3x} = \dots\dots\dots$

- (a) 16 (b) 12 (c) $\frac{3}{4}$ (d) $\frac{4}{3}$

(15) $\lim_{x \rightarrow \infty} \frac{5 + x^{-2}}{3x^{-2} + 1} = \dots\dots\dots$

- (a) $\frac{5}{3}$ (b) 5 (c) 3 (d) $\frac{1}{3}$

(16) If $f(x) = x^2$, then $\lim_{x \rightarrow 3} f(f(x)) = \dots\dots\dots$

- (a) 81 (b) 18 (c) 36 (d) 9

(17) $\lim_{x \rightarrow a} \frac{x^8 - a^8}{x^4 - a^4} = 32$, then $a = \dots\dots\dots$

- (a) ± 4 (b) 4 (c) ± 2 (d) 2

(18) $\lim_{x \rightarrow 4} \frac{x + \sqrt{x} - 6}{x - 4} = \dots\dots\dots$

- (a) $\frac{5}{4}$ (b) $\frac{1}{5}$ (c) $\frac{1}{4}$ (d) $\frac{4}{5}$

- (19) If $f(x) = x^2 - 4$, $g(x) = x + 2$, Graph the function $\frac{f}{g}$, determine the domain and the range then investigate its monotony.

(20) Find : $\lim_{x \rightarrow 0} \frac{x^2 + \sin 5x}{3x \cos 4x}$



First

Multiple choice questions (One mark for each question)

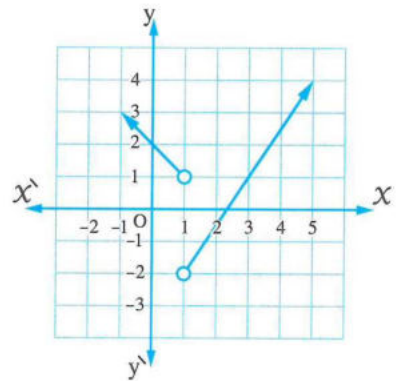
- (1) The solution set in $\mathbb{R}$ of the equation : $|3x - 9| = 15$ is

(a) $\{2, 8\}$ (b) $\{-2, 8\}$ (c) $\{2, -8\}$ (d) $\{-2, -8\}$

- (2) In the opposite figure :

The domain of the function =

(a) $\{1\}$
 (b) $\mathbb{R} - \{1, -1\}$
 (c) $\mathbb{R} - \{1\}$
 (d) $\mathbb{R}$



- (3) If $f(x) = x + 1$, $g(x) = x^2$, then $(f \circ g)(2) = \dots\dots\dots$

(a) 3 (b) 4 (c) 5 (d) 9

- (4) $\log_7 25 \times \log_6 7 \times \log_5 6 = \dots\dots\dots$

(a) 0 (b) 1 (c) 2 (d) 3

- (5) If $f(x) = x - 1$, $f(x)$ is

(a) even (b) not one to one function
 (c) odd (d) one to one function

- (6) If $f(x) = 2^x$, then $f(x+2) = \dots\dots\dots \times 2^x$

(a) 1 (b) 2 (c) 3 (d) 4

- (7) In $\triangle ABC$, $m(\angle A) = 112^\circ$, $m(\angle B) = 38^\circ$ and $c = 19$ cm., then length of the diameter of the circumcircle of is cm.

(a) 16 (b) 19 (c) 38 (d) 112

(8) In $\triangle LMN$, $m(\angle L) = 60^\circ$ and $m(\angle M) = 30^\circ$, then $n : m = \dots\dots\dots$

- (a) $\sqrt{3} : 1$ (b) $\sqrt{3} : 2$ (c) $1 : 2$ (d) $2 : 1$

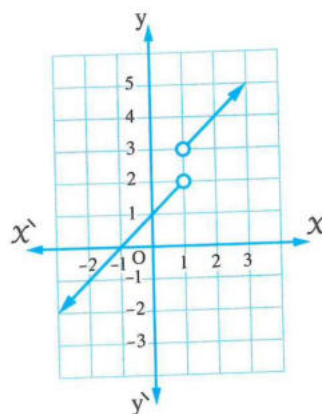
(9) In $\triangle XYZ$, $\cos(X + Z) = \dots\dots\dots$

- (a) $\cos Z + \cos X$ (b) $\cos Y$ (c) $-\cos Y$ (d) $\cos(90^\circ + Y)$

(10) In the opposite figure :

$$\lim_{x \rightarrow 1} f(x) = \dots\dots\dots$$

- (a) 1
(b) 2
(c) 3
(d) doesn't exist



(11) $\lim_{x \rightarrow \infty} \frac{x^2 + 1}{2x - 1} = \dots\dots\dots$

- (a) 0 (b) $\frac{1}{2}$ (c) 1 (d) ∞

Second

Multiple choice questions (two marks for each question)

(12) The curve of $g(x) = x^2 + 4$ is the same curve of $f(x) = x^2$ by translation of magnitude 4 units in the direction of $\dots\dots\dots$

- (a) $\overrightarrow{OX}$ (b) $\overrightarrow{OX}$ (c) $\overrightarrow{OY}$ (d) $\overrightarrow{OY}$

(13) $\lim_{x \rightarrow 4} \frac{x - 4}{x^2 - 7x + 12} \dots\dots\dots$

- (a) 8 (b) -1 (c) 1 (d) 7

(14) The exponential function, whose base a is increasing if $\dots\dots\dots$

- (a) $a < 0$ (b) $a > 1$ (c) $0 < a < 1$ (d) $a = 1$

(15) If $7^{\log X} = 2^{\log 7}$, then $X = \dots\dots\dots$

- (a) 7 (b) 2 (c) 5 (d) 9

(16) The result of $3 + \infty$ is $\dots\dots\dots$

- (a) 3 (b) ∞ (c) $-\infty$ (d) impossible

(17) $\lim_{x \rightarrow 1} \frac{\sin(x - 1)}{x - 1} = \dots\dots\dots$

- (a) 0 (b) $\frac{1}{2}$ (c) 1 (d) 2

(18) ABC is a triangle in which : $a = 12$ cm, $c = 20$ cm, $m(\angle B) = 120^\circ$, then $b = \dots\dots\dots$ cm.

- (a) 12 (b) 20 (c) 25 (d) 28

(19) Find the solution set of the inequality in $\mathbb{R} : |3 - 2x| \leq 1$

(20) Discuss the continuity of the function $f : f(x) = \begin{cases} x^2 - 7 & , \text{ when } x \leq 3 \\ 8 - 2x & , \text{ when } x > 3 \end{cases}$ at $x = 3$

11

Damiette Governorate



Language Schools

First

Multiple choice questions (One mark for each question)

(1) The domain of the $f(x) = \frac{x}{|x| + k}$ is $\mathbb{R} - \{5, -5\}$, then $k = \dots\dots\dots$

(a) 5

(b) -5

(c) ± 5

(d) zero

(2) The opposite figure

represents the curves of the two functions

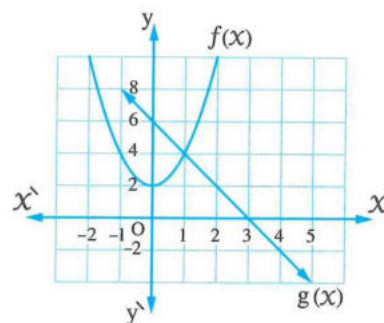
f and g , then $(g \circ f)(1) = \dots\dots\dots$

(a) 6

(b) 5

(c) -2

(d) 4



(3) If $\lim_{x \rightarrow 2} \frac{(x+1)^4 - 81}{x-2} = \dots\dots\dots$

(a) 108

(b) 27

(c) 2

(d) undefined

(4) In $\triangle ABC : m(\angle A) = 45^\circ$, $m(\angle C) = 60^\circ$, the radius of the circle passes through its vertices = 20 cm., length of $\overline{AC} \approx \dots\dots\dots$ cm.

(a) 18

(b) 19

(c) 38

(d) 39

(5) $\lim_{x \rightarrow 0} \frac{\tan(mx)}{kx} = 2$, $\lim_{x \rightarrow 0} \frac{\sin(kx)}{nx} = 3$, then $\frac{m}{n} = \dots\dots\dots$

(a) $\frac{3}{2}$ (b) $\frac{2}{3}$

(c) 6

(d) 1

(6) In $\triangle ABC$: if $4 \sin A = 3 \sin B = 2 \sin C$, then $a : b : c = \dots\dots\dots$

(a) 2 : 3 : 4

(b) 4 : 2 : 3

(c) 6 : 4 : 3

(d) 3 : 4 : 6

(7) Let $f(x) = x^3$ translated 3 units to the right and 2 units downward and the resulted curve is $g(x)$, then $g(-1) = \dots\dots\dots$

(a) -64

(b) 6

(c) -1

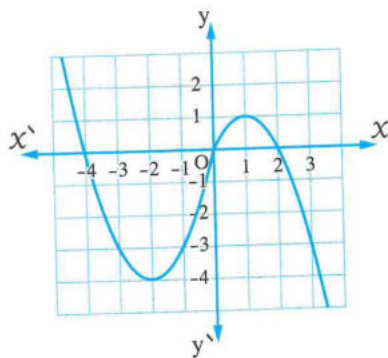
(d) -66

- (8) The solution set of the equation : $\log (X+2) + \log (X-2) = 1 - \log 2$ in $\mathbb{R}$ is
- (a) $\{3\}$ (b) $\{3, -3\}$ (c) $\{1, 2\}$ (d) $\{5\}$
- (9) ABCD is a parallelogram , in which $AB = 8$ cm. , $BC = 11$ cm. , $BD = 9$ cm. , then $\cos (\angle ABC) = \dots\dots\dots$
- (a) $\frac{13}{22}$ (b) $\frac{23}{33}$ (c) $-\frac{13}{22}$ (d) $-\frac{23}{33}$
- (10) The solution set of the inequality : $\sqrt{X^2 - 2X + 1} \geq 4$ in $\mathbb{R}$ is
- (a) $[-3, 5]$ (b) $\mathbb{R} -]-3, 5[$ (c) $] -3, 5[$ (d) $\mathbb{R} - [-3, 5]$
- (11) The solution set of the equation : $9^X + 27 = 12 \times 3^X$ in $\mathbb{R}$ is
- (a) $\{1, 2\}$ (b) $\{3, 9\}$ (c) $\{9, 27\}$ (d) $\emptyset$

Second

Multiple choice questions (two marks for each question)

- (12) $\lim_{x \rightarrow \infty} \frac{X^{-3} + 2X^{-2} + 1}{2X^{-3} - 3X^{-1} + 3} = \dots\dots\dots$
- (a) 2 (b) 3 (c) $\frac{1}{2}$ (d) $\frac{1}{3}$
- (13) In ΔABC if $(a + b - c)(a + b + c) = 3ab$, then $m(\angle C) = \dots\dots\dots^\circ$
- (a) 30 (b) 60 (c) 120 (d) 150
- (14) If L and M are the two roots of the equation : $2X^2 - 9X + 8 = 0$, then the value of $\log_2 L + \log_2 M = \dots\dots\dots$
- (a) 2 (b) 4 (c) 12 (d) 8
- (15) If $f(X) = 5^X$, then the value of X which satisfies $f(X-1) = 125$ is
- (a) 1 (b) 2 (c) 3 (d) 4
- (16) The solution set of the equation : $X^{\frac{4}{3}} = 16$ in $\mathbb{R}$ is
- (a) $\{8, -8\}$ (b) $\{8\}$ (c) $\{-8\}$ (d) $\{4, -4\}$
- (17) The opposite figure represents the curve of function $f(X)$:
then $\lim_{x \rightarrow 1} f(X) = \dots\dots\dots$
- (a) -1 (b) 1
(c) -3 (d) does not exist
- (18) All the following functions are one - to - one on their domain except
- (a) $f(X) = 4X$ (b) $g(X) = \frac{2}{X}$ (c) $h(X) = 3$ (d) $k(X) = X^3$



Third

Essay questions

- (19) Graph the function $f : f(x) = \begin{cases} x & \text{at } x \leq 0 \\ x^2 & \text{at } x > 0 \end{cases}$, from the graph deduce the range of the function and determine its type whether its even, odd or otherwise.

- (20) If $f : f(x) = \begin{cases} x^2 + kx - 2 & , x > 2 \\ 4 & , x = 2 \\ 5k + mx & , x < 2 \end{cases}$ is continuous at $x = 2$, find value of k, m

12

El-Beheira Governorate



Maths Supervision

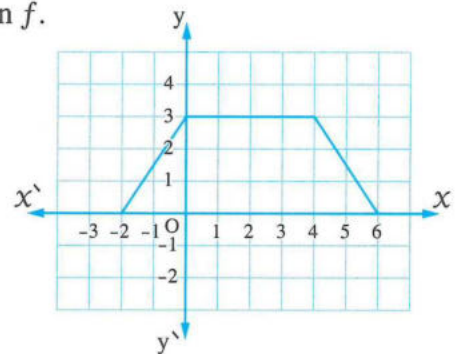
First

Multiple choice questions (One mark for each question)

- (1) The opposite figure represents the curve of the function f .

Which of the following statements is wrong ?

- (a) f increasing in $]-2, 0[$
 (b) f decreasing in $]4, 6[$
 (c) f constant in $]-2, 6[$
 (d) f constant in $]0, 4[$



- (2) Type of function $f : f(x) = \frac{\cos x}{x}$ is

- (a) Even (b) Odd
 (c) Neither even nor odd (d) linear

- (3) If the function : $f : f(x) = \left(\frac{a}{2}\right)^x$ is an exponential and increasing function, then :

- (a) $a < -2$ (b) $a = 2$ (c) $a > 2$ (d) $a < 2$

- (4) If the relationship between $x, f(x), R(x)$ is as in the opposite table : , then : $R(f(2)) = \dots\dots\dots$

- (a) 1 (b) 2
 (c) 3 (d) 4

x	$f(x)$	$R(x)$
1	3	4
2	1	3
3	4	2
4	2	1

- (5) The solution set of the inequality : $|x| > x$ is

- (a) $\emptyset$ (b) $]0, \infty[$ (c) $]-\infty, 0[$ (d) $\mathbb{R}$

(6) All of the following statements are identical except

(where $a, x, n \in \mathbb{R}^+ - \{1\}$)

(a) $\frac{\log x}{\log a^n}$

(b) $\log_a (x^n)$

(c) $\frac{1}{n} \log_a (x)$

(d) $\log_a (\sqrt[n]{x})$

(7) In the opposite figure :

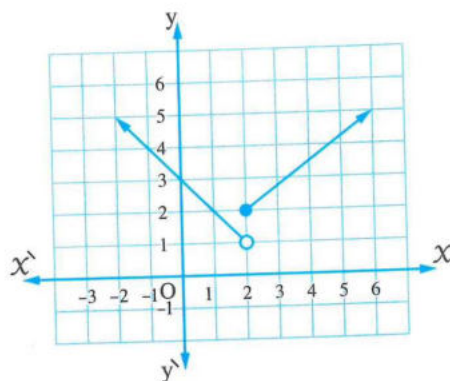
$\lim_{x \rightarrow 2} f(x) = \dots\dots\dots$

(a) 1

(b) 2

(c) 3

(d) Not exist



(8) $\lim_{x \rightarrow \infty} (3x^{-5} + 4x^{-2} + 5) = \dots\dots\dots$

(a) 0

(b) ∞

(c) $-\infty$

(d) 5

(9) In triangle XYA, which of the following statements is correct ?

(a) $\sin X + \cos Y = X + y$

(b) $X = y \sin A$

(c) $X \sin Y = y \sin X$

(d) $\frac{X}{\sin X} = \frac{\sin Y}{y}$

(10) The triangle cannot be solved with the information

(a) the lengths of the three sides

(b) the lengths of two sides and the measure of the angle between them

(c) the measure of its three angles

(d) the length of a side and the measures of two angles.

(11) ABC is a triangle in which $b = 2$ cm. and $c = 2.5$ cm. and $\cos A = \frac{2}{5}$

, then the triangle ABC is

(a) Right-angled

(b) Isosceles

(c) Equilateral

(d) Scale-sided

Second

Multiple choice questions (two marks for each question)

(12) ΔABC in it : $6 \text{ m } (\angle A) = 4 \text{ m } (\angle B) = 3 \text{ m } (\angle C)$, the length of the radius of the circle passing through its vertices = 10 cm., then : the area of $\Delta ABC \approx \dots\dots\dots \text{ cm}^2$

(a) 110

(b) 100

(c) 115

(d) 120

(13) The solution of the equation : $\log\left(\frac{x}{2}\right) \times \log\left(\frac{2}{x}\right) = -1$ in $\mathbb{R}$ is

(a) $\{0.2\}$

(b) $\{10\}$

(c) $\{20\}$

(d) $\{20, 0.2\}$

(14) $\lim_{x \rightarrow \infty} 2x \sin \frac{3}{x} = \dots\dots\dots$

(a) $\frac{3}{2}$

(b) $\frac{2}{3}$

(c) 6

(d) 0

(15) Solution set of the equation : $|2x + 5| = x - 4$ in $\mathbb{R}$ is $\dots\dots\dots$

(a) $\{-9\}$

(b) $\{-\frac{1}{3}\}$

(c) $\{-9, -\frac{1}{3}\}$

(d) $\emptyset$

(16) If the function f is continuous at $x = 1$

where $f(x) = \begin{cases} \frac{1-x}{2-\sqrt{x+3}} & , x \neq 1 \\ x+k & , x = 1 \end{cases}$, then $k = \dots\dots\dots$

(a) 1

(b) 2

(c) 3

(d) 4

(17) $\lim_{x \rightarrow 1} \frac{x^{100} + x^{50} + k}{x-1} = 150$, then $k = \dots\dots\dots$

(a) 1

(b) -1

(c) 2

(d) -2

(18) If $f(x) = 3^x$, then $f^{-1}(x) = \dots\dots\dots$.

(a) $\log_3 x$

(b) $\log_x 3$

(c) x^{-3}

(d) 3^x

Third

Essay questions

(19) Use the function graph $f(x) = \frac{1}{x}$ to draw the function graph $r(x)$ where $r(x) - 1 = f(x-2)$

From the graph , determine the domain and range.

(20) Find $\lim_{x \rightarrow 0} \frac{x \tan x}{1 - \cos^2 3x}$

13

El-Menia Governorate



Matay Zone

First

Multiple choice questions (One mark for each question)

(1) If $f(x) = 3x + 1$, $g(x) = x^2 + a$ and $(f \circ g)(2) = -2$, then $a = \dots\dots\dots$

(a) 2

(b) 3

(c) 5

(d) -5

(2) If f is odd function , then $\frac{2f(x) + 8f(-x)}{3f(x)} = \dots\dots\dots$

(a) zero

(b) -2

(c) -4

(d) 4

(3) The symmetric point of the function $f : f(x) = x^3 - 2$

(a) $(0, -2)$

(b) $(-2, 0)$

(c) $(2, 0)$

(d) $(0, 2)$

- (4) If the curve of the function f intersects the curve of the function f^{-1} at $(k, 2k - 3)$, then $k = \dots\dots\dots$
- (a) 1 (b) 3 (c) -3 (d) -1
- (5) The solution set of the equation $3^{x+1} - 3^{x-1} = 24$ in $\mathbb{R}$ is $\dots\dots\dots$
- (a) $\{3\}$ (b) $\{8\}$ (c) $\{\text{zero}\}$ (d) $\{2\}$
- (6) $\log_5 \log_2 (32) = \dots\dots\dots$
- (a) 1 (b) 2 (c) 5 (d) 10
- (7) $\lim_{x \rightarrow 0} \frac{3x}{\sin 5x} = \dots\dots\dots$
- (a) $\frac{5}{3}$ (b) $\frac{3}{5}$ (c) 5 (d) 3
- (8) $\lim_{x \rightarrow 3} \frac{x^2 - 8x + 15}{x - 3} = \dots\dots\dots$
- (a) zero (b) -2 (c) 5 (d) not exist
- (9) If $\triangle ABC$, $m(\angle A) = 30^\circ$, $a = 6$ cm., then $\frac{b}{\sin B} = \dots\dots\dots$
- (a) 3 (b) 6 (c) $\frac{1}{5}$ (d) 12
- (10) In $\triangle ABC$, r is the radius length of its circumcircle, then $\frac{b}{2 \sin B} = \dots\dots\dots$
- (a) r (b) $2r$ (c) $\frac{1}{2}r$ (d) $4r$
- (11) The measure of the greatest angle in the triangle whose side lengths are 3 cm., 5 cm., 7 cm. = $\dots\dots\dots^\circ$
- (a) 110 (b) 150 (c) 100 (d) 120

Second

Multiple choice questions (two marks for each question)

- (12) The domain of the function $f : f(x) = \frac{5}{\sqrt{x+1}-2}$ is $\dots\dots\dots$
- (a) $[-1, \infty[- \{3\}$ (b) $]-1, \infty[- \{3\}$ (c) $[-1, \infty[$ (d) $[-1, \infty[- \{5\}$
- (13) If $\left(\frac{3}{4}\right)^{a^2 - 2a - 3} = 1$ Where $a > \text{zero}$, then $a = \dots\dots\dots$
- (a) 1 (b) 2 (c) 3 (d) 4
- (14) The domain of the function $f : f(x) = \log_{x-1} (6-x)$ is $\dots\dots\dots$
- (a) $]1, 6[$ (b) $\mathbb{R} -]1, 6[$ (c) $]1, 6[- \{2\}$ (d) $[1, 6]$
- (15) $\lim_{x \rightarrow 1} \frac{x-1}{\sqrt{x+3}-2} = \dots\dots\dots$
- (a) 1 (b) 2 (c) 3 (d) 4

(16) $\lim_{x \rightarrow a} \frac{x^5 - a^5}{x^3 - a^3} = 60$, then $a = \dots\dots\dots$

(a) ± 2

(b) ± 3

(c) ± 5

(d) ± 6

(17) $\lim_{x \rightarrow \infty} \frac{x^{-3} + 2x^{-2} + 1}{2x^{-2} - x^{-1} + 3} = \dots\dots\dots$

(a) 2

(b) $\frac{1}{2}$

(c) 3

(d) $\frac{1}{3}$

(18) The perimeter of $\Delta ABC = 24$ cm. , and $\frac{\sin A}{3} = \frac{\sin B}{4} = \frac{\sin C}{5}$,
then the area of $\Delta ABC = \dots\dots\dots \text{cm}^2$

(a) 47

(b) 24

(c) 12

(d) 30

Third Essay questions

(19) Find the solution set of the inequality : $\sqrt{(x+2)^2} + |2x+4| \leq 6$ in $\mathbb{R}$

(20) The function $f : f(x) = \begin{cases} x^2 - 1 & , \quad x \geq 2 \\ x - 2a & , \quad x < 2 \end{cases}$ is continuous at $x = 2$ Find the value of a

14

Assiut Governorate



Administration of Education

First Multiple choice questions (One mark for each question)

(1) The curve of the function $f(x) = |x - 3|$ is symmetric about the straight line $\dots\dots\dots$

(a) $x = 3$

(b) $x = -3$

(c) $y = 3$

(d) $y = -3$

(2) In ΔXYZ , the expression $\frac{x^2 + y^2 - z^2}{2xy}$ equals $\dots\dots\dots$

(a) $\cos X$

(b) $\cos Y$

(c) $\cos Z$

(d) $\sin Z$

(3) $\lim_{x \rightarrow 3} \frac{\sqrt{x+1} - 2}{x-3} = \dots\dots\dots$

(a) 4

(b) $\frac{1}{4}$

(c) 6

(d) $\frac{1}{6}$

(4) If r is the radius length of the circumcircle of ΔABC and $a = r$, then $m(\angle A) = \dots\dots\dots$

(a) 30° only.

(b) 30° or 120°

(c) 150° only.

(d) 30° or 150°

(5) The solution set of the inequality : $\sqrt{x^2 - 6x + 9} \leq 3$ in $\mathbb{R}$ is $\dots\dots\dots$

(a) $]0, 6[$

(b) $[0, 6]$

(c) $\mathbb{R} -]0, 6[$

(d) $\mathbb{R} - [0, 6]$

(6) The solution set of equation : $\frac{|x|}{x} = 1$ in $\mathbb{R}$ is $\dots\dots\dots$

(a) $\{0\}$

(b) $\mathbb{R}^+$

(c) $\mathbb{R}^-$

(d) $[0, \infty[$

(7) The solution set of equation : $(2x - 1)^4 = 81$ in $\mathbb{R}$ is

- (a) $\{2, -1\}$ (b) $\{-2, -1\}$ (c) $\{2, 1\}$ (d) $\{-2, 1\}$

(8) If $\lim_{x \rightarrow a} \frac{ax^2}{2} = 32$, then $a =$

- (a) 2 (b) 4 (c) $4\sqrt{2}$ (d) 8

(9) $\lim_{x \rightarrow 0} \frac{\sin 2x \cos 3x}{6x} =$

- (a) 1 (b) 3 (c) $\frac{1}{3}$ (d) zero

(10) If $3^x = 5$, then $x =$

- (a) 3 (b) $\log_3 5$ (c) $\log_5 3$ (d) $\frac{5}{3}$

(11) $\sqrt[n]{a} \times \sqrt[m]{a} =$

- (a) $\sqrt[nm]{a}$ (b) $\sqrt[n+m]{a}$ (c) $\sqrt[\frac{1}{m} + \frac{1}{n}]{a}$ (d) $\sqrt[nm]{a^{m+n}}$

Second

Multiple choice questions (two marks for each question)

(12) If $f : f(x) = \begin{cases} \frac{\tan 3x}{x} & , x > 0 \\ 2 + \cos x & , x \leq 0 \end{cases}$, then $\lim_{x \rightarrow 0} f(x) =$

- (a) 2 (b) 3 (c) 4 (d) $\frac{3}{2}$

(13) In any triangle $\frac{\sin(A+B)}{\sin A + \sin B} =$

- (a) $\frac{c}{a+b}$ (b) $\frac{a}{b+c}$ (c) 1 (d) $\frac{b}{a+c}$

(14) In $\triangle ABC$, if $a = 4$ cm., $b = 5$ cm., $\cos C = \frac{2}{5}$, then $c =$ cm.

- (a) 4 (b) 5 (c) 6 (d) 8

(15) $\lim_{x \rightarrow \infty} \sqrt{\frac{3+2x}{4x-1}} =$

- (a) $\frac{1}{2}$ (b) $\frac{3}{4}$ (c) $\frac{1}{\sqrt{2}}$ (d) $\frac{\sqrt{3}}{2}$

(16) If $\log_{|x+2|} 64 = 3$, then $x \in$

- (a) $\{6, -2\}$ (b) $\{2, -6\}$ (c) $\{0, -8\}$ (d) $\{4, -8\}$

(17) If $f(x) = x + 5$, then $f^{-1}(x) =$

- (a) $x + 5$ (b) $x - 5$ (c) $-x + 5$ (d) $\frac{x}{5}$

(18) If $f(x) = x^3$, $g(x) = x + 2$, then $(g \circ f)(x)$ is function.

- (a) one-to-one (b) odd (c) even (d) linear

Third

Essay questions

(19) If $f(x) = \begin{cases} x^2 - 1 & , \quad x \geq 2 \\ x - 2a & , \quad x < 2 \end{cases}$ is continuous at $x = 2$, then find the value of a

(20) Graph the function $f : f(x) = \frac{1}{x-2} + 3$ and from the graph find the range and monotonicity.

15

Aswan Governorate



Mathematics supervision

First

Multiple choice questions (one mark for each question)

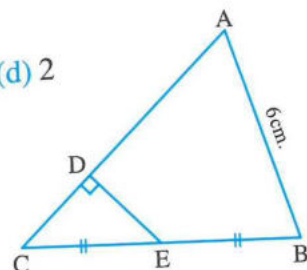
- (1) If $f : [-1, 2] \rightarrow \mathbb{R}$ where $f(x) = x + 2$, $g : [0, 3] \rightarrow \mathbb{R}$ where $g(x) = x + 1$, then $(f + g)(3) = \dots\dots\dots$
- (a) 3 (b) 4 (c) 9 (d) undefined
- (2) The curve of the function $f(x) = x^2 + 4$ is the same curve of the function $f(x) = x^2$ with displacement equals 4 units in the direction of $\dots\dots\dots$
- (a) $\vec{OX}$ (b) $\vec{OX}$ (c) $\vec{Oy}$ (d) $\vec{Oy}$
- (3) The solution set of the equation : $|x| + 6 = 5$ is $\dots\dots\dots$
- (a) $\{1, -1\}$ (b) $\{-11, -1\}$ (c) $\{-5, 5\}$ (d) $\emptyset$
- (4) The solution set of the inequality $\frac{1}{|x-2|} > \frac{1}{2}$ is $\dots\dots\dots$
- (a) $]0, 4[- \{2\}$ (b) $[0, 4] - \{2\}$ (c) $[0, 4]$ (d) $]0, 4]$
- (5) The exponential function : $f(x) = a^x$ is decreasing when $\dots\dots\dots$
- (a) $a > 0$ (b) $0 < a < 1$ (c) $-1 < a < 0$ (d) $a < 0$
- (6) If the function : $f(x) = 5x$, then $f^{-1}(x) = \dots\dots\dots$
- (a) $-5x$ (b) $5 - x$ (c) $\frac{x}{5}$ (d) $\frac{5}{x}$
- (7) $\lim_{x \rightarrow 0} \frac{\sin 2x + 3 \tan x}{5x} = \dots\dots\dots$
- (a) 1 (b) $\frac{6}{5}$ (c) $\frac{1}{5}$ (d) 2
- (8) $\lim_{h \rightarrow 0} \frac{(x+h)^7 - x^7}{h} = \dots\dots\dots$
- (a) x^7 (b) $7x^6$ (c) 0 (d) 1
- (9) In $\triangle ABC$: $\frac{\sin A}{3} = \frac{2 \sin B}{5} = \frac{\sin C}{4}$, then $a : b : c = \dots\dots\dots$
- (a) 6 : 5 : 8 (b) 8 : 5 : 6 (c) 7 : 2 : 4 (d) 3 : 5 : 4

- (10) The measure of the greatest angle in ΔABC in which $a = 8$ cm, $b = 7$ cm. and $c = 13$ cm. is
- (a) 60° (b) 150° (c) 120° (d) 135°
- (11) In ΔABC : $a = 10$ cm. , $b = 6$ cm. and $m(\angle C) = 60^\circ$, then $c \approx$ cm.
- (a) 7.8 (b) 8.7 (c) 16 (d) 64

Second

Multiple choice questions (two marks for each question)

- (12) If $f(x) = \sqrt{x+4}$, $g(x) = x^2 - 4$, then $(f \circ g)(x) =$
- (a) x (b) $|x|$ (c) x^2 (d) x^3
- (13) If the curve of $f(x) = \log_a x$ passes through the point $(8, 3)$, then $f(2) =$
- (a) 2 (b) -2 (c) 4 (d) 1
- (14) If $\log 3 = x$, $\log 5 = y$, then , $\log 15 =$
- (a) xy (b) $x - y$ (c) $x + y$ (d) $\log x + \log y$
- (15) $\lim_{x \rightarrow 3} \frac{x^2 - k}{x - 3} = 6$, then $k =$
- (a) 1 (b) -9 (c) -3 (d) 9
- (16) If the function $f(x) = \begin{cases} \sin x \cot 2x & , x \neq 0 \\ k & , x = 0 \end{cases}$ is continuous at $x = 0$, then $k =$
- (a) 0 (b) $-\frac{1}{2}$ (c) $\frac{1}{2}$ (d) 2
- (17) $\lim_{x \rightarrow \infty} \frac{(m-6)x^3 + 3x^2 - 1}{2x^2 + x + 2mx^3} = 2$, then $m =$
- (a) -2 (b) -1 (c) 1 (d) 2
- (18) In the opposite figure :
- If $m(\angle CDE) = 90^\circ$, $\tan(\angle DEC) = \frac{3}{4}$, then
- the radius length of the circumcircle of $\Delta ABC =$ cm.
- (a) 3.5 (b) 3.75 (c) 3 (d) 5



Third

Essay questions

- (19) Represent graphically the function $f : f(x) = |x - 2|$ and from the graph determine its range and discuss its monotonicity and show its type whether it is even or odd or otherwise and is $f(x)$ a one - to - one function or not ?

- (20) If $f(x) = \begin{cases} \sqrt{x+3} - 2 & , x > 1 \\ 1 - \frac{3}{4}x & , x \leq 1 \end{cases}$ Discuss the existence of $\lim_{x \rightarrow 1} f(x)$ at $x = 1$ (showing steps)

Answers of school examinations

1 Cairo

- (1) (a) (2) (d) (3) (c) (4) (a)
 (5) (c) (6) (b) (7) (a) (8) (a)
 (9) (d) (10) (d) (11) (b) (12) (c)
 (13) (b) (14) (d) (15) (c) (16) (a)
 (17) (b) (18) (a)

(19)

∴ The function is continuous at $x = 2$

$$\begin{aligned} \therefore f(2^+) &= f(2) & \therefore (2^2 + 2 \cdot 2 - 2) &= 4 & \therefore k &= 1 \\ \therefore f(2^-) &= f(2) & \therefore 5k + 2m &= 4 \\ \therefore 5(1) + 2m &= 4 & \therefore m &= -\frac{1}{2} \end{aligned}$$

(20)

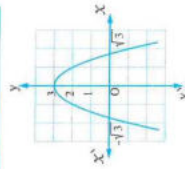
The range is $]-\infty, 3]$

The type: Even

Monotony:

The function is increasing on

$]-\infty, 0]$ and decreasing on $]0, \infty[$



2 Cairo

- (1) (b) (2) (b) (3) (a) (4) (a)
 (5) (b) (6) (b) (7) (c) (8) (b)
 (9) (d) (10) (c) (11) (b) (12) (a)
 (13) (c) (14) (c) (15) (c) (16) (b)
 (17) (a) (18) (b)

(19)

The range is $[1, \infty[$

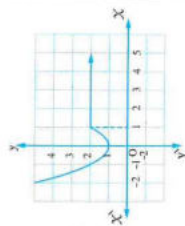
The function is

decreasing on $]-\infty, 0]$

increasing on

$]0, 1]$ and constant on

$]1, \infty[$



(20)

∴ $f(x)$ is continuous on $\mathbb{R}$

$$\begin{aligned} \therefore f(-2^-) &= f(-2^+) \\ \therefore 3(-2) - 2 &= -2a + b \\ \therefore -2a + b &= -8 \\ \therefore f(5^+) &= f(5^-) \\ (5)^2 - 12 &= 5a + b \\ \therefore 5a + b &= 13 \end{aligned}$$

By solving (1), (2):

$$a = 3, b = -2$$

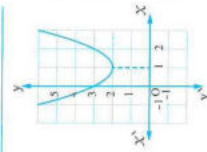
3 Giza

- (1) (d) (2) (a) (3) (c) (4) (a) (5) (d)
 (6) (a) (7) (a) (8) (c) (9) (d) (10) (c)
 (11) (a) (12) (b) (13) (b) (14) (c) (15) (b)
 (16) (d) (17) (c) (18) (c)

(19)

(1) The domain = $\mathbb{R}$

(2) The function is neither odd nor even



(20)

$$\begin{aligned} f(3^+) &= \lim_{x \rightarrow 3} \frac{x^2 - 7x + 12}{x - 3} = \lim_{x \rightarrow 3} \frac{(x-3)(x-4)}{(x-3)} \\ &= \lim_{x \rightarrow 3} (x-4) = 3 - 4 = -1 \end{aligned}$$

$$\therefore f(3^-) = \lim_{x \rightarrow 3} (2x - 7) = 2(3) - 7 = -1$$

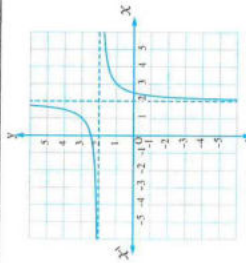
$$\therefore f(3^+) = (3^-) = -1$$

$$\therefore \lim_{x \rightarrow 3} f(x) = -1$$

4 Alexandria

- (1) (a) (2) (b) (3) (c) (4) (c)
 (5) (d) (6) (c) (7) (a) (8) (b)
 (9) (a) (10) (c) (11) (c) (12) (d)
 (13) (c) (14) (b) (15) (c) (16) (d)
 (17) (b) (18) (c)

(19)



• The range = $\mathbb{R} - \{2\}$

• f is increasing on $]-\infty, 2[$ and $]2, \infty[$

(20)

$$\begin{aligned} f(-3^+) &= f(-3^-) = \lim_{x \rightarrow -3} \frac{(x^2 + 2x - 3)}{(x+3)} \\ &= \lim_{x \rightarrow -3} \frac{(x+3)(x-1)}{(x+3)} \\ &= \lim_{x \rightarrow -3} (x-1) = -3 - 1 = -4 \\ \therefore -3 + a &= -4 & \therefore a &= -1 \end{aligned}$$

5 El-Kalyoubia

- (1) (b) (2) (c) (3) (c) (4) (d)
 (5) (a) (6) (b) (7) (d) (8) (c)
 (9) (b) (10) (a) (11) (a) (12) (b)
 (13) (b) (14) (a) (15) (a) (16) (a)
 (17) (a) (18) (a)

(19)

∴ $f(x) = g(x)$

$$\therefore f(x) = (2a-8)x^3 + 5x^2 - x + c$$

$$\therefore g(x) = (a+b)x^2 + cx - k + 3$$

$$\therefore 2a - 8 = 0 & \therefore a = 4$$

$$\therefore a + b = 5$$

$$\therefore 4 + b = 5$$

$$\therefore b = 1$$

$$\therefore c = -1$$

$$\therefore c = -k + 3$$

$$\therefore k = 3 - (-1) = 4$$

$$\therefore ab + ck = (4)(1) + (-1)(4) = 0$$

(20)

$$f(-1) = 3(-1) + 7 = 4$$

$$f(-1^-) = \lim_{x \rightarrow -1} (3x + 7) = 4$$

$$f(-1^+) = \lim_{x \rightarrow -1} (4) = 4$$

$$\therefore f(-1) = f(-1^-) = f(-1^+)$$

∴ The function f is continuous at $x = -1$

$$f(2) = 4$$

$$f(2^-) = \lim_{x \rightarrow 2} 4 = 4$$

$$f(2^+) = \lim_{x \rightarrow 2} (2^2 - 3) = 1$$

$$\therefore f(2) = f(2^-) \neq f(2^+)$$

∴ The function f is not continuous at $x = 2$

∴ The function f is continuous on $]-4, 4[- \{2\}$

6 El-Sharkia

- (1) (b) (2) (c) (3) (d) (4) (b)
 (5) (d) (6) (b) (7) (c) (8) (c)
 (9) (a) (10) (b) (11) (b) (12) (d)
 (13) (d) (14) (a) (15) (d) (16) (d)
 (17) (b) (18) (d)

(19)

$$\begin{aligned} \lim_{x \rightarrow -2} \frac{(x+3)^5 - 1}{x^2 - 4} &= \lim_{x \rightarrow -2} \frac{(x+3)^5 - 1^5}{(x+2)(x-2)} \\ &= \lim_{x \rightarrow -2} \frac{(x+3)^5 + 1^5}{(x+3)-1} \times \lim_{x \rightarrow -2} \frac{1}{(x-2)} \\ &= 5(1)^4 \times \frac{1}{(-2)-2} = -\frac{5}{4} \end{aligned}$$

(20)

$$|3x - 2| \geq 7$$

$$3x - 2 \geq 7, \text{ then } x \geq 3$$

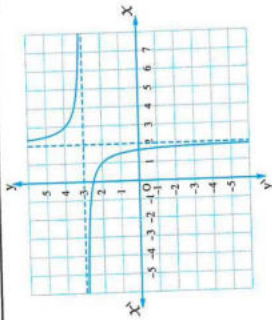
$$\text{or } 3x - 2 \leq -7, \text{ then } x \leq -\frac{5}{3}$$

$$\text{The S.S.} = \mathbb{R} - \left] -\frac{5}{3}, 3 \right]$$

7 El-Monofia

- (1) (d) (2) (a) (3) (c) (4) (b)
 (5) (c) (6) (a) (7) (d) (8) (d)
 (9) (c) (10) (a) (11) (d) (12) (b)
 (13) (c) (14) (a) (15) (a) (16) (d)
 (17) (a) (18) (c)

(19)

The domain $\mathbb{R} - \{2\}$ The range $\mathbb{R} - \{3\}$ The function decreases on $]-\infty, 2[$ and decreases on $]2, +\infty[$

(20)

$$f(0^+) = f(0^-) = \lim_{x \rightarrow 0} \frac{(x+2)^5 - 32}{x} = \lim_{x \rightarrow 0} \frac{(x+2)^5 - (2)^5}{x} = 5(2)^4 = 80$$

 $\therefore$ The function continuous at $x = 0$

$$\therefore f(0) = f(0^+) = f(0^-) = 80$$

$$\therefore 5k = 80 \quad \therefore k = 16$$

8 El-Gharbia

- (1) (b) (2) (d) (3) (d) (4) (d)
 (5) (c) (6) (d) (7) (b) (8) (c)
 (9) (a) (10) (b) (11) (c) (12) (d)
 (13) (b) (14) (c) (15) (b) (16) (b)
 (17) (b) (18) (c)

(19)

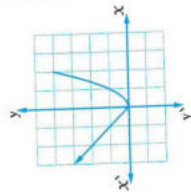
The range = $[0, +\infty[$

The function

is decreasing

on $]-\infty, 0[$ and increasingon $]0, +\infty[$

The function is neither odd nor even

 $\therefore$ The function is not one-to-one

(20)

$$f(1) = 4(1) - 1 = 3$$

$$f(1^-) = \lim_{x \rightarrow 1^-} (4x - 1) = 4(1) - 1 = 3$$

$$f(1^+) = \lim_{x \rightarrow 1^+} (x^2 + 2) = (1)^2 + 2 = 3$$

$$\therefore f(1) = f(1^+) = f(1^-)$$

 $\therefore$ The function is continuousat $x = 1$

9 El-Dakhia

- (1) (a) (2) (a) (3) (b) (4) (a)
 (5) (c) (6) (d) (7) (a) (8) (a)
 (9) (d) (10) (d) (11) (c) (12) (b)
 (13) (c) (14) (a) (15) (b) (16) (a)
 (17) (c) (18) (a)

(19)

$$\frac{f(x)}{g(x)} = \frac{x^2 - 4}{x + 2} = \frac{(x-2)(x+2)}{x+2}$$

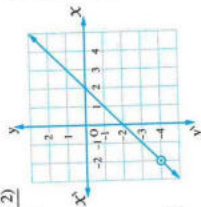
$$\text{The domain } \mathbb{R} - \{-2\}$$

$$\therefore f(x) = x - 2$$

$$\therefore g(x) = x - 2$$

The range = $\mathbb{R} - \{-4\}$

The function is increasing

on $\mathbb{R} - \{-2\}$ 

10 El-Ismaïlia

- (1) (b) (2) (c) (3) (c) (4) (c)
 (5) (d) (6) (d) (7) (c) (8) (d)
 (9) (c) (10) (d) (11) (d) (12) (c)
 (13) (c) (14) (b) (15) (b) (16) (b)
 (17) (c) (18) (d)

$$\lim_{x \rightarrow 0} \frac{x + \left(\frac{\sin 5x}{x}\right) \cdot \frac{0+5}{3} = \frac{5}{3}}$$

(19)

$$\therefore |3 - 2x| \leq 1$$

$$\therefore -4 \leq -2x \leq -2$$

$$2 \geq x \geq 1$$

$$\therefore \text{The S.S.} = [1, 2]$$

(20)

$$f(3) = (3)^2 - 7 = 2$$

$$f(3^-) = \lim_{x \rightarrow 3^-} (x^2 - 7) = (3)^2 - 7 = 2$$

$$f(3^+) = \lim_{x \rightarrow 3^+} (8 - 2x) = 2$$

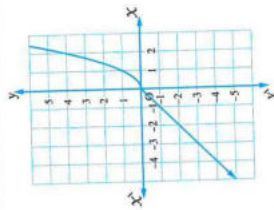
$$\therefore f(3) = f(3^-) = f(3^+)$$

 $\therefore$ The function is continuous at $x = 3$

11 Damiette

- (1) (b) (2) (c) (3) (a) (4) (d)
 (5) (c) (6) (d) (7) (d) (8) (a)
 (9) (c) (10) (b) (11) (a) (12) (d)
 (13) (b) (14) (a) (15) (d) (16) (a)
 (17) (b) (18) (c)

(19)

The range $\mathbb{R}$

The function is neither odd nor even.

(20)

$$f(2) = 4$$

$$f(2^+) = \lim_{x \rightarrow 2^+} (x^2 + kx - 2) = 2 + 2k$$

$$f(2^-) = \lim_{x \rightarrow 2^-} (5k + mX) = 5k + 2m$$

$$\therefore f(x) \text{ is continuous at } x = 2$$

$$\therefore f(2) = f(2^+) = f(2^-)$$

$$\therefore 2 + 2k = 4 \text{ hence } k = 1$$

$$\therefore 5k + 2m = 4$$

$$\therefore 5 + 2m = 4 \text{ hence } m = \frac{-1}{2}$$

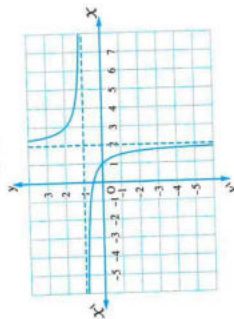
12 El-Beheira

- (1) (c) (2) (b) (3) (c) (4) (d)
 (5) (c) (6) (b) (7) (d) (8) (d)
 (9) (c) (10) (c) (11) (b) (12) (a)
 (13) (d) (14) (c) (15) (d) (16) (c)
 (17) (d) (18) (a)

(19)

$$\therefore r(x) - 1 = f(x - 2)$$

$$\therefore r(x) = f(x - 2) + 1 = \frac{1}{x - 2} + 1$$

The domain = $\mathbb{R} - \{2\}$ The range = $\mathbb{R} - \{1\}$

(20)

$$\lim_{x \rightarrow 0} \frac{x \tan x}{1 - \cos^2 3x} = \lim_{x \rightarrow 0} \frac{\left(\frac{\tan x}{x}\right) \cdot \frac{1}{x}}{\frac{\sin^2 3x}{x^2}} = \frac{1}{(3)^2} = \frac{1}{9}$$

13 El-Menia

- (1) (d) (2) (b) (3) (a) (4) (b)
 (5) (d) (6) (a) (7) (b) (8) (b)
 (9) (d) (10) (a) (11) (d) (12) (a)
 (13) (c) (14) (c) (15) (d) (16) (d)
 (17) (d) (18) (b)

(19)

$$\therefore \sqrt{(x+2)^2} + 2|x+4| \leq 6$$

$$\therefore |x+2| + 2|x+4| \leq 6$$

$$\therefore 3|x+2| \leq 6$$

$$\therefore |x+2| \leq 2$$

$$\therefore -2 \leq x+2 \leq 2$$

$$\therefore -4 \leq x \leq 0$$

$$\therefore \text{The S.S.} = [-4, 0]$$

(20)

$$f(2) = (2)^2 - 1 = 3$$

$$f(2^-) = \lim_{x \rightarrow 2^-} (x - 2a) = 2 - 2a$$

$\therefore f(x)$ is continuous at $x = 2$

$$\therefore 2 - 2a = 3$$

$$\therefore a = -\frac{1}{2}$$

14 Assiut

- (1) (a) (2) (c) (3) (b) (4) (d)
 (5) (b) (6) (b) (7) (a) (8) (b)
 (9) (c) (10) (b) (11) (d) (12) (b)
 (13) (a) (14) (b) (15) (c) (16) (b)
 (17) (b) (18) (a)

(19)

$$f(2) = (2)^2 - 1 = 3$$

$$f(2^-) = \lim_{x \rightarrow 2^-} (x - 2a) = 2 - 2a$$

$\therefore f(x)$ is continuous at $x = 2$

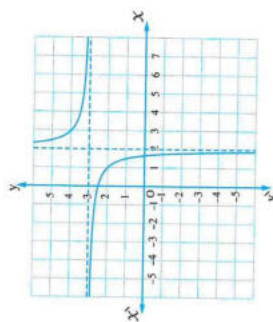
$$\therefore f(2^-) = f(2)$$

$$\therefore 2 - 2a = 3$$

$$\therefore a = -\frac{1}{2}$$

(20)

$$f(x) = \frac{1}{x-2}$$



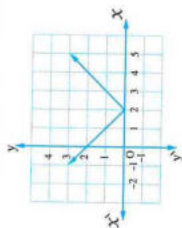
The range = $\mathbb{R} - \{3\}$

The function is decreasing on each $] -\infty, 2[$ and $] 2, \infty[$

15 Aswan

- (1) (d) (2) (c) (3) (d) (4) (a)
 (5) (b) (6) (c) (7) (a) (8) (b)
 (9) (a) (10) (c) (11) (b) (12) (b)
 (13) (d) (14) (c) (15) (d) (16) (c)
 (17) (a) (18) (b)

(19)



The range = $[0, \infty[$

The function is decreasing

on $] -\infty, 2[$ and is increasing on $] 2, \infty[$

The function is neither odd nor even.

$f(x)$ is not one-to-one

(20)

$$f(1^-) = \lim_{x \rightarrow 1^-} \left(1 - \frac{3}{4}x\right)$$

$$= 1 - \frac{3}{4}(1) = \frac{1}{4}$$

$$f(1^+) = \lim_{x \rightarrow 1^+} \left(\frac{\sqrt{x+3}-2}{x-1}\right) \times \left(\frac{\sqrt{x+3}+2}{\sqrt{x+3}+2}\right)$$

$$= \lim_{x \rightarrow 1^+} \frac{(x-1)}{(x-1)(\sqrt{x+3}+2)} = \frac{1}{4}$$

$$\therefore f(1^-) = f(1^+) = \frac{1}{4}$$

$$\therefore \lim_{x \rightarrow 1} f(x) = \frac{1}{4}$$

كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



حمل الآن

مجاناً وحصرياً

امتحانات رقم (2)

الترم الاول



1

Cairo Governorate

Misr El-Gadida Zone
Mathematics Supervision**First Multiple choice questions**Interactive
test ①

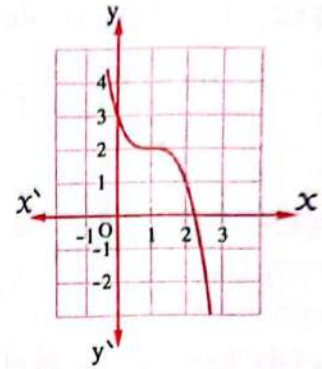
Choose the correct answer from those given :

- (1) If $f : [-3, 5] \longrightarrow \mathbb{R}$, $f(x) = \frac{1+x}{x+4}$, then the domain of f is
- (a) $\mathbb{R} - \{-4\}$ (b) $\mathbb{R}^+$ (c) $\mathbb{R} -]-3, 5[$ (d) $[-3, 5]$
- (2) If $f(x) = x^2 + 6$, $g(x) = 3x$, then $(f \circ g)(3) = \dots\dots\dots$
- (a) 75 (b) 87 (c) 125 (d) 45
- (3) The function $f(x) = x \tan x$ is
- (a) even. (b) odd.
(c) one-to-one. (d) neither even nor odd.
- (4) $\lim_{x \rightarrow 3} \frac{\sqrt{x+1} - 2}{x-3} = \dots\dots\dots$ cm.
- (a) zero (b) $\frac{1}{4}$ (c) $\frac{1}{2}$ (d) 1
- (5) In ΔABC If $a = b$, then $\cos(B + C) = \dots\dots\dots$
- (a) $\frac{2b^2}{c}$ (b) $\frac{-c}{2b}$ (c) $\frac{c}{4a}$ (d) $\frac{b}{2a}$
- (6) If $\lim_{x \rightarrow 2} \frac{x^2 - k}{x - 2} = 4$, then $k = \dots\dots\dots$
- (a) 4 (b) 2 (c) 1 (d) 8
- (7) $\frac{\log 49}{\log 7} = \dots\dots\dots$
- (a) $\log 7$ (b) $\log 2$ (c) 2 (d) 7
- (8) The solution set of the inequality : $|x + 3| \leq 0$ is
- (a) $\emptyset$ (b) $]-\infty, 3]$ (c) $]-3, \infty[$ (d) $\{-3\}$
- (9) Point of symmetry of the function $f(x) = \frac{1}{x+3} + 2$ is
- (a) $(3, -2)$ (b) $(-3, -2)$ (c) $(3, 2)$ (d) $(-3, 2)$
- (10) In ΔXYZ , if $\frac{z}{\sin Z} = 10$, then $\frac{x}{\sin X} + \frac{y}{\sin Y} = \dots\dots\dots$
- (a) 10 (b) 20 (c) 60 (d) 90
- (11) $\lim_{x \rightarrow 2} \frac{x^5 - 32}{x - 2} = \dots\dots\dots$
- (a) 70 (b) 80 (c) 60 (d) 50

- (12) If the length of the radius of the circumcircle of the triangle ABC, is 6 cm.
 , then $\frac{2c}{\sin C} = \dots\dots\dots$ cm.
 (a) 12 (b) 8 (c) 4 (d) 24
- (13) $\lim_{x \rightarrow \infty} \frac{2x^2 + 1}{x^2 + 1} = \dots\dots\dots$
 (a) 0 (b) doesn't exist (c) ∞ (d) 2
- (14) The solution set of the equation : $4^{x+2} = x^{x+2}$ is $\dots\dots\dots$
 (a) $\{-4, 4, 2\}$ (b) $\{-2\}$ (c) $\{-4, 4, -2\}$ (d) $\{4, -2, 2\}$
- (15) If $f(x) = 2x$, then the domain of $f^{-1}(x)$ is $\dots\dots\dots$
 (a) $\mathbb{R}$ (b) $\mathbb{R} - \{2\}$ (c) $[-2, 2]$ (d) $\mathbb{R} - \left\{\frac{1}{2}\right\}$
- (16) Measure of the greatest angle of a triangle of side lengths 3 cm. , 5 cm. , 7 cm.
 is $\dots\dots\dots^\circ$
 (a) 150 (b) 60 (c) 120 (d) 30
- (17) Number of solutions of the triangle ABC , in which $m(\angle C) = 115^\circ$, $c = 7$ cm.
 , $b = 4$ cm. is $\dots\dots\dots$
 (a) zero (b) 1 (c) 2 (d) infinite number.
- (18) $f(x) = 2^{x+3}$, then $f(-3) = \dots\dots\dots$
 (a) zero (b) 1 (c) $\frac{1}{2}$ (d) $\frac{1}{8}$
- (19) $\lim_{x \rightarrow 0} \frac{\sin^2 3x + x^2}{x^2} = \dots\dots\dots$
 (a) 10 (b) 4 (c) 9 (d) 3
- (20) $\lim_{x \rightarrow 0} \frac{1 - \cos x}{3x} = \dots\dots\dots$
 (a) zero (b) 1 (c) $\frac{1}{3}$ (d) doesn't exist.
- (21) The solution set of the equation : $2^{x+1} + 2^x = 12$ is $\dots\dots\dots$
 (a) $\{3\}$ (b) $\{3, 2\}$ (c) $\{-3\}$ (d) $\{2\}$
- (22) $\log_a x = y$ is equivalent to $\dots\dots\dots$
 (a) $\log_a y = x$ (b) $a^y = x$ (c) $a^x = y$ (d) $y = a^x$
- (23) $\lim_{x \rightarrow 4} \frac{x^2 - 24}{x - 4} = \dots\dots\dots$
 (a) 96 (b) 48 (c) 32 (d) undefined.

(24) Which of the following rules represents the curve in the given figure

- (a) $f(x) = (x-1)^3 - 2$
 (b) $f(x) = 2 - (x-1)^3$
 (c) $f(x) = (x+1)^3 - 2$
 (d) $f(x) = -(x-1)^3 - 2$



(25) $\log_{xy} x + \log_{xy} y = \dots\dots\dots$

- (a) x (b) y (c) xy (d) 1

(26) If $f(x) = \begin{cases} ax^2 - 3, & x \neq 2 \\ 2a, & x = 2 \end{cases}$ is continuous at $x = 2$, then $a = \dots\dots\dots$

- (a) $\frac{1}{2}$ (b) $\frac{2}{3}$ (c) $\frac{3}{2}$ (d) 6

(27) $\log \cos \theta + \log \sec \theta = \dots\dots\dots$ where $\theta \in]0, \frac{\pi}{2}[$

- (a) 1 (b) zero (c) 2 (d) -1

Second Essay questions

Answer the following questions :

1 Graph the curve of the function $f(x) = |x-2| + 3$ and from the graph determine the domain, the range, discuss the monotony and show if the function is even, odd or otherwise.

2 Find : $\lim_{x \rightarrow \infty} \frac{3x^{-3} - 5x^{-1} + 1}{7 + 4x^{-1} + 5x^{-2}}$

2

Cairo Governorate



El-Salam Educational Zone
Mathematics Supervision

First Multiple choice questions

Choose the correct answer from those given :

(1) The domain of the function $f(x) = \sqrt{x-2} + \sqrt{5-x}$ equal to

- (a) $[5, \infty[$ (b) $]-\infty, 2]$ (c) $[2, 5]$ (d) $\mathbb{R}$

(2) All functions defined by the following rules are not one-to-one except

- (a) $f(x) = x^2$ (b) $f(x) = 5$ (c) $f(x) = x + 2$ (d) $f(x) = \sin x$

(3) If $f(x)$ is an odd function, then $\frac{3f(x) + 9f(-x)}{2f(x)} = \dots\dots\dots$ where $f(x) \neq \text{zero}$

- (a) zero (b) -3 (c) -4 (d) 4



Interactive
test ②

- (4) $f(x) = 2x + 1$ and $g(x) = 3x - 4$, $2 \in$ the domain of $(f \circ g)$, then $(f \circ g)(2) = \dots\dots\dots$
- (a) 2 (b) 3 (c) 4 (d) 5
- (5) The solution set of the equation $|2x + 4| = 1 - x$ is $\dots\dots\dots$
- (a) $\{-1, -5\}$ (b) $\{1, -5\}$ (c) $\{1, 5\}$ (d) $\{-1, 5\}$
- (6) The solution set of the inequality $|\frac{x-3}{4}| \leq 1$, is $\dots\dots\dots$
- (a) $\mathbb{R} -]-1, 7[$ (b) $[-1, 7]$ (c) $] -1, 7[$ (d) $\mathbb{R} - [-1, 7]$
- (7) The inverse function of the function $f(x) = \sqrt{x-2}$, $x \geq 2$ is $f^{-1}(x) = \dots\dots\dots$, $x \geq 0$
- (a) $x^2 - 2$ (b) $x^2 + 2$ (c) $x^2 + 1$ (d) $x + 1$
- (8) If $f(x) = 5^x$, then $\frac{f(x+3) + f(x+1)}{f(x+2)} = \dots\dots\dots$
- (a) 5.2 (b) 20.2 (c) 25 (d) 30
- (9) The solution set of the equation : $(3x + 2)^{\frac{3}{4}} = 8$ is $\dots\dots\dots$
- (a) $\frac{15}{2}$ (b) $\frac{14}{3}$ (c) $\frac{17}{2}$ (d) 6
- (10) If $3^x = 5$, then $x = \dots\dots\dots$ approximately.
- (a) 1.46 (b) 1.64 (c) 0.6 (d) 0.62
- (11) The solution set of the equation : $25^x - 20 \times 5^x - 125 = 0$ is $\dots\dots\dots$
- (a) $\{1\}$ (b) $\{2\}$ (c) $\{3\}$ (d) $\{4\}$
- (12) The solution set of the equation $\log_x 5x = 2$ is $\dots\dots\dots$
- (a) $\{0, 5\}$ (b) $\{0\}$ (c) $\{5\}$ (d) $\{2\}$
- (13) If $\log_2 x = \log_{27} 27$, then $x = \dots\dots\dots$
- (a) 8 (b) 4 (c) 3 (d) 2
- (14) $\lim_{x \rightarrow 2} \frac{x^4 - 16}{x^3 + 8} = \dots\dots\dots$
- (a) 0 (b) 1 (c) 2 (d) 3
- (15) If $\lim_{x \rightarrow 2} \frac{x^2 - 4a}{x - 2}$ is exist, then $a = \dots\dots\dots$
- (a) 4 (b) 1 (c) -4 (d) -1
- (16) If $\lim_{x \rightarrow \infty} \frac{ax^3 - 5x^2 - 1}{2x^b + 8x + 9} = 3$, then $a + b = \dots\dots\dots$
- (a) 6 (b) 9 (c) 3 (d) 1
- (17) $\lim_{h \rightarrow 0} \frac{(x+h)^7 - x^7}{h} = \dots\dots\dots$
- (a) zero (b) $7x^6$ (c) $7x^7$ (d) x^7

- (18) $\lim_{x \rightarrow 0} \frac{\sin^2 3x + \tan 5x^2}{x^2 \cos 5x - 3 \sin^2 x} = \dots\dots\dots$
 (a) 3 (b) -5 (c) 8 (d) -7
- (19) $\lim_{x \rightarrow 3} \frac{x^2 - 9}{\sqrt[3]{x-2} - 1} = \dots\dots\dots$
 (a) zero (b) 5 (c) 7 (d) 12
- (20) $\lim_{x \rightarrow \infty} \frac{4x^{-5} - 3x^{-2} + 8}{3x^{-5} - 3x^{-3} + 2} = \dots\dots\dots$
 (a) 2 (b) 4 (c) 6 (d) 8
- (21) $\lim_{x \rightarrow \infty} \frac{\tan \frac{8}{x}}{\frac{2}{x}} = \dots\dots\dots$
 (a) 16 (b) 8 (c) 4 (d) -4
- (22) In triangle XYZ, if $2 \sin X : 4 \sin Y : 3 \sin Z$, then $X : y : z = \dots\dots\dots$
 (a) 2 : 3 : 4 (b) 4 : 2 : 3 (c) 3 : 4 : 6 (d) 6 : 3 : 4
- (23) The length of a side in a triangle is equal to 6 cm. and the measure of the angle opposite to this side is 60° , then the area of circumcircle of this triangle = $\dots\dots\dots \text{cm}^2$
 (a) 3π (b) 6π (c) 9π (d) 12π
- (24) ΔABC in which $a = 8 \text{ cm.}$, $b = 5 \text{ cm.}$ and the angle between them is 30° , then the area of $\Delta ABC = \dots\dots\dots \text{cm}^2$
 (a) 10 (b) 20 (c) 30 (d) 40
- (25) ΔABC if, $m(\angle B) = 76^\circ$, $c = 12 \text{ cm.}$, $a = 10 \text{ cm.}$, then $b \simeq \dots\dots\dots \text{cm.}$
 (a) 12.6 (b) 13.6 (c) 14.6 (d) 15.6
- (26) The measure of the largest angle in ΔABC in which $a = 14 \text{ cm.}$, $b = 15 \text{ cm.}$, $c = 17 \text{ cm.}$ equals $\dots\dots\dots$ to the nearest degree.
 (a) 72 (b) 56 (c) 40 (d) 30
- (27) In $\Delta ABC : a(b \cos C + c \cos B) = \dots\dots\dots$
 (a) a^2 (b) b^2 (c) c^2 (d) $2b^2$

Second

Essay questions

Answer the following questions :

- 1 Draw the curve of the function $f(x) = x^2 - 4x + 4$, showing the domain of the function and, then determine the range of the function

- 2 If the function $f(x) = \begin{cases} ax^2 + 5 & , x \leq 2 \\ 9 - bx^2 & , x > 2 \end{cases}$ is continuous at $x = 2$

Find the value of : $a + b$

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Cairo Governorate



West Zone
Mathematics Supervision



Interactive
test 3

First Multiple choice questions

Choose the correct answer from those given :

(1) If $\left(\frac{1}{2}\right)^{a^2-a-2} = 1 : a > 0$, then $a = \dots\dots\dots$

- (a) 1 (b) -3 (c) 2 (d) 3

(2) If $f(x) = |x - 2| + 4$, then the solution set of the equation $f(x + 2) = 6$ is $\dots\dots\dots$

- (a) $\{1, 3\}$ (b) $\emptyset$ (c) $\mathbb{R}$ (d) $\{-2, 2\}$

(3) In $\triangle ABC$, if $m(\angle A) = 30^\circ$, $c = 15\sqrt{3}$ cm. , $m(\angle C) = 60^\circ$, then $a = \dots\dots\dots$ cm.

- (a) 30 (b) 45 (c) 15 (d) 60

(4) If $f(x) = \begin{cases} a + \cos x & , x < 0 \\ \frac{\tan 2x}{a x} & , 0 < x < \frac{\pi}{4} \end{cases}$, and $\lim_{x \rightarrow 0} f(x)$ exists , then $a = \dots\dots\dots$

- (a) 0 or 1 (b) 1 or -2 (c) 2 or 3 (d) 1 or 3

(5) If $y = \sqrt[3]{x}$, then its inverse function is $y = \dots\dots\dots$

- (a) $\frac{1}{3} x^3$ (b) x^3 (c) $x^3 - 1$ (d) $3 x^2$

(6) $\lim_{x \rightarrow 0} \frac{\tan^2 2x}{x \sin 3x} = \dots\dots\dots$

- (a) $\frac{1}{6}$ (b) $\frac{3}{8}$ (c) $\frac{1}{2}$ (d) $\frac{4}{3}$

(7) The one-to-one function from those defined by the following rules is $\dots\dots\dots$

- (a) $f(x) = 3 - x^2$ (b) $f(x) = x^3 + 3$
(c) $f(x) = \sin x \tan x$ (d) $f(x) = x^2 + x$

(8) The curve of the function $f : f(x) = 5^x$ intersects the y-axis at the point $\dots\dots\dots$

- (a) (1 , 0) (b) (0 , 1) (c) (5 , 1) (d) (1 , 5)

(9) A circle with diameter length 20 cm. , passes through the vertices of $\triangle ABC$, which is an acute-angled triangle in which $BC = 10$ cm. , then $m(\angle A) = \dots\dots\dots^\circ$

- (a) 30 (b) 60 (c) 45 (d) 150

- (10) If $f(x) = 5x + 4$, $g(x) = 2 - x$, then $(f \circ g)(-2) + (g \circ f)(5) = \dots\dots\dots$
 (a) 24 (b) -27 (c) 49 (d) -3
- (11) ABCD is a parallelogram in which $AB = 8$ cm., $BC = 11$ cm., $BD = 9$ cm., then the length of $\overline{AC} \approx \dots\dots\dots$ cm.
 (a) 9 (b) 10 (c) 17 (d) 11
- (12) $\lim_{x \rightarrow \infty} \frac{x^7 - 2x^3}{2x^4 - 3x^2 - 1} = \dots\dots\dots$
 (a) 0 (b) 3 (c) ∞ (d) $\frac{1}{2}$
- (13) If $\log_3(4 + \log_2 x) = 2$, then $x = \dots\dots\dots$
 (a) 16 (b) 32 (c) 64 (d) 128
- (14) $\lim_{x \rightarrow 3} \frac{\sqrt{x+1} - 2}{x-3} = \dots\dots\dots$
 (a) 4 (b) $\frac{1}{4}$ (c) 6 (d) $\frac{1}{6}$
- (15) The solution set of the inequality: $|3x + 2| + 5 \leq 4$ in $\mathbb{R}$ is $\dots\dots\dots$
 (a) $[-3, \frac{2}{3}]$ (b) $\mathbb{R} -]-3, \frac{2}{3}[$ (c) $\emptyset$ (d) $\mathbb{R}$
- (16) $\lim_{x \rightarrow -3} \frac{x^2 + 4x + 3}{x^2 - 9} = \dots\dots\dots$
 (a) not exist (b) $\frac{1}{3}$ (c) $-\frac{1}{3}$ (d) 1
- (17) The function $f: f(x) = (x-1)^2 + 2$ is increasing on the interval $\dots\dots\dots$
 (a) $\mathbb{R}$ (b) $] -\infty, 1[$ (c) $] 1, \infty[$ (d) $] -1, 1[$
- (18) In ΔABC , $a = 27$ cm., $m(\angle B) = 82^\circ$, $m(\angle C) = 56^\circ$, then its surface area $\approx \dots\dots\dots$ cm².
 (a) 540 (b) 447 (c) 350 (d) 400
- (19) $\lim_{x \rightarrow -2} \frac{x^7 + 128}{x^4 - 16} = \dots\dots\dots$
 (a) 9 (b) -9 (c) -14 (d) 14
- (20) If $x^{\frac{5}{3}} = 2$ $y^{\frac{4}{3}} = 32$, then $x + y = \dots\dots\dots$
 (a) 16 (b) zero (c) 16, -16 (d) zero, 16
- (21) The number of possible solutions of ΔABC in which $m(\angle C) = 115^\circ$, $c = 12$ cm., $a = 9$ cm. is $\dots\dots\dots$
 (a) 1 (b) 2 (c) 3 (d) zero
- (22) The domain of the function $f: f(x) = \frac{1}{\sqrt{9-x^2}}$ is $\dots\dots\dots$
 (a) $\mathbb{R}$ (b) $\mathbb{R} - [-3, 3]$ (c) $\mathbb{R} - \{-3, 3\}$ (d) $] -3, 3[$

(23) If $\log (X + 11) = 2$, then $X = \dots\dots\dots$

- (a) -9 (b) 22 (c) 89 (d) 91

(24) $\lim_{x \rightarrow 4} \frac{(x-3)^2 - 1}{x-4} = \dots\dots\dots$

- (a) zero (b) 2 (c) 3 (d) 4

(25) If ABC is a triangle in which $c^2 = (a+b)^2 - ab$, then $m(\angle C) = \dots\dots\dots^\circ$

- (a) 30 (b) 45 (c) 60 (d) 120

(26) The function $f : f(x) = \log_a x$, is decreasing when $a \in \dots\dots\dots$

- (a) $[0, \infty[$ (b) $]-\infty, 0[$ (c) $]0, 1[$ (d) $]1, \infty[$

(27) $\lim_{x \rightarrow 0} \frac{(x+2)^5 - 32}{x} = \dots\dots\dots$

- (a) 80 (b) -8 (c) -80 (d) $\frac{1}{8}$

Second Essay questions

Answer the following questions :

1 Draw the graph of the function $f : f(x) = \sqrt{x^2 - 8x + 16}$, from the graph determine the domain, range and discuss the monotony of f

2 If the function $f : f(x) = \begin{cases} \frac{x^7 - 128}{x^3 - 8} & , x \neq 2 \\ k & , x = 2 \end{cases}$ is continuous in $\mathbb{R}$, find the value of k

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Giza Governorate



Mathematics Inspection

First Multiple choice questions

Choose the correct answer from those given :

(1) The domain of the function f where $f(x) = \frac{x+1}{\sqrt[3]{x-1}}$ is $\dots\dots\dots$

- (a) $\mathbb{R} - \{1\}$ (b) $\mathbb{R} - \{-1\}$ (c) $[-1, \infty[$ (d) $\mathbb{R}$

(2) If $f(x) = x - 3$, $g(x) = x^2$, then $(f \circ g)(x) = \dots\dots\dots$

- (a) $(x-3)^2$ (b) $x^2 - 3$ (c) $x^2 + 3$ (d) $\sqrt{x-3}$



Interactive test 4

- (3) If f is an even function and $f(5) = 1$, $f(-5) = 3 - k$, then $k = \dots\dots\dots$
 (a) 1 (b) 5 (c) 3 (d) 2
- (4) The range of the function $f : f(x) = \frac{3x^2 - 3}{x^2 - 1}$ is $\dots\dots\dots$
 (a) $\mathbb{R} - \{1, -1\}$ (b) $\mathbb{R} - \{3, -3\}$ (c) $\{3, -3\}$ (d) $\{3\}$
- (5) The function $f : f(x) = x^2 + x^4 + 1$ is symmetric about $\dots\dots\dots$
 (a) the origin. (b) the x -axis.
 (c) the y -axis. (d) it has neither symmetric point nor symmetric line.
- (6) If $f(x) = |x - 2| + 4$, then the solution set of the equation $f(x + 2) = 6$ is $\dots\dots\dots$
 (a) $\{0, 4\}$ (b) $\{2, -2\}$ (c) $\{2, 4\}$ (d) $\{-2, -4\}$
- (7) If $2^{x-1} = 44$, then $2^{x-2} = \dots\dots\dots$
 (a) 18 (b) 22 (c) 10 (d) 16
- (8) If $f(x) = (5)^{-x}$, then $\frac{f(x-1)}{f(x+1)} = \dots\dots\dots$
 (a) 5 (b) $\frac{1}{5}$ (c) 25 (d) $\frac{1}{25}$
- (9) If $f(x) = 3^x$, then the value of x which satisfies the equation :
 $f(x+1) - f(x-1) = 24$ is $\dots\dots\dots$
 (a) 2 (b) 3 (c) 8 (d) zero.
- (10) The S.S. of the equation $\log_x 81 = 4$ in $\mathbb{R}$ is $\dots\dots\dots$
 (a) $\{-3\}$ (b) $\{3\}$ (c) $\{3, -3\}$ (d) $\{9\}$
- (11) If $\log_3 5 = a$, then $\log_{15} 5 = \dots\dots\dots$
 (a) a^2 (b) $3a$ (c) $\frac{1}{a+3}$ (d) $\frac{a}{a+1}$
- (12) The domain of the function $f : f(x) = \log_x (5 - x)$ is $\dots\dots\dots$
 (a) $]0, 5[- \{1\}$ (b) $[0, 5]$ (c) $]0, 5[$ (d) $] -\infty, 5[$
- (13) If $f(x) = x^3 + 7$, then $f^{-1}(-1) = \dots\dots\dots$
 (a) 1 (b) 2 (c) -2 (d) 8
- (14) $\lim_{x \rightarrow 2} \frac{x-3}{x-2} = \dots\dots\dots$
 (a) -1 (b) $-\frac{3}{2}$ (c) $\frac{3}{2}$ (d) does not exist.
- (15) If $\lim_{x \rightarrow a} \frac{x^8 - a^8}{x^6 - a^6} = 48$, then $a = \dots\dots\dots$
 (a) 4 (b) 6 (c) ± 4 (d) ± 6

- (16) $\lim_{x \rightarrow \infty} (3x^{-5} + 4x^{-2} + 5) = \dots\dots\dots$
 (a) 12 (b) ∞ (c) 5 (d) zero
- (17) $\lim_{x \rightarrow 0} \frac{x^2 + \sin^2 2x}{x \tan 2x} = \dots\dots\dots$
 (a) $\frac{2}{5}$ (b) $\frac{5}{2}$ (c) 1 (d) 5
- (18) $\lim_{x \rightarrow \frac{1}{2}} (10) = \dots\dots\dots$
 (a) 5 (b) 20 (c) 10 (d) $10\frac{1}{2}$
- (19) If $f(x) = \begin{cases} x^2 - 1 & , x > 2 \\ 3x + 1 & , x \leq 2 \end{cases}$, then $\lim_{x \rightarrow 3} f(x) = \dots\dots\dots$
 (a) does not exist. (b) 3 (c) 8 (d) 7
- (20) If $f : f(x) = \begin{cases} x^2 - 2x & \text{at } x \geq 1 \\ kx - 3 & \text{at } x < 1 \end{cases}$ is continuous at $x = 1$, then $k = \dots\dots\dots$
 (a) zero (b) 1 (c) 2 (d) 3
- (21) If $\lim_{x \rightarrow \infty} \frac{ax^2 - 5x}{2x + 3x^2} = 3$, then $a = \dots\dots\dots$
 (a) 3 (b) 6 (c) 9 (d) 12
- (22) In triangle ABC, $m(\angle A) = 45^\circ$, the length of the radius of its circumcircle = 6 cm.
 , then $a = \dots\dots\dots$ cm.
 (a) 13 (b) $6\sqrt{2}$ (c) 12 (d) $\sqrt{2}$
- (23) If ABCD is a cyclic quadrilateral, then $\cos A + \cos C = \dots\dots\dots$
 (a) 1 (b) zero (c) $\frac{1}{2}$ (d) -1
- (24) If ΔABC is a right-angled at $\angle B$ and $b = 10$ cm., then $\frac{a}{\sin A} + \frac{c}{\sin C} = \dots\dots\dots$ cm.
 (a) 10 (b) 20 (c) 40 (d) 100
- (25) If the area of $\Delta ABC = 12 \text{ cm}^2$, then $(b^2 + c^2 - a^2) \tan A = \dots\dots\dots$
 (a) 12 (b) 24 (c) 48 (d) 96
- (26) In ΔABC , $a = 9$ cm., $b = 15$ cm., $m(\angle C) = 106^\circ$
 , then its perimeter $\approx \dots\dots\dots$ cm.
 (a) 44 (b) 24 (c) 34 (d) 28
- (27) If the perimeter of ΔABC is 24 cm. and $\sin A + \sin B = 3 \sin C$, then $c = \dots\dots\dots$ cm.
 (a) 4 (b) 6 (c) 8 (d) 9

Second Essay questions

Answer the following questions :

1 If $f(x) = \begin{cases} \frac{(x-3)^6 - 1}{x-4} & , x > 4 \\ x+2 & , x < 4 \end{cases}$, find : $\lim_{x \rightarrow 4} f(x)$

2 Find the solution set in $\mathbb{R} : |2x - 3| + 3 > 7$

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Giza Governorate



Awseem Directorate
Mathematics Inspection

First Multiple choice questions

Choose the correct answer from those given :



Interactive
test 5

(1) The domain of the function $f : f(x) = \frac{5}{\sqrt{x+1}-2}$ is

- (a) $[-1, \infty[- \{3\}$ (b) $[-1, \infty[- \{5\}$ (c) $[-1, \infty[- \{3\}$ (d) $[-1, \infty[$

(2) If $f : \mathbb{R} \rightarrow \mathbb{R}$, $f(x) = 3x + 1$, $g(x) = \begin{cases} 2x + 1 & , x > 2 \\ 3x & , x < 2 \end{cases}$, then $(f \circ g)(3) = \dots\dots\dots$

- (a) 21 (b) 22 (c) 28 (d) 30

(3) If $f : (x) = \frac{a}{x+b} + c$ where a, b, c are real numbers and its point of symmetry is $(4, 4)$, then $a^{b+c} = \dots\dots\dots$

- (a) a^{16} (b) a^8 (c) 1 (d) zero

(4) If $f(x) = |x - 3| + 1$, then the S.S. of the equation : $f(x + 3) = 4$ is

- (a) $\{3, -3\}$ (b) $\{3, 0\}$ (c) $\{0, -3\}$ (d) $\{3\}$

(5) The function $f(x) = (x - 2)^2 + 1$ is increasing in the interval

- (a) $]2, \infty[$ (b) $]-1, \infty[$ (c) $]1, \infty[$ (d) $]-\infty, 2[$

(6) Assume that the function $f(x) = x^3$ is translated 3 units to the right and 2 units downwards and the resulting curve is $g(x)$, then $g(-1) = \dots\dots\dots$

- (a) -64 (b) 6 (c) -1 (d) -66

(7) If $7^{x-1} = 3^{2x-2}$, then $5^{x+1} = \dots\dots\dots$

- (a) zero (b) 25 (c) 1 (d) 5

(8) The set of real roots of the equation : $(x - 5)^4 = 16$ is

- (a) $\{2, -2\}$ (b) $\{7\}$ (c) $\{3\}$ (d) $\{3, 7\}$

- (9) If $2^a = x$, $5^a = y$, $7^a = z$, then $140^a = \dots\dots\dots$
 (a) xyz (b) xy^2z (c) x^2yz (d) xyz^2
- (10) If $f(x) = 2x + k$ is the inverse function of $g(x) = mx + 3$, then $m \times k = \dots\dots\dots$
 (a) 3 (b) 6 (c) -12 (d) -3
- (11) If $\log_2 x = \log_5 125$, then $\log_8 x = \dots\dots\dots$
 (a) zero (b) 1 (c) 8 (d) 512
- (12) If $-2 \log_3 [2 + \log_5 (x - 3)] = -2$, then $x = \dots\dots\dots$
 (a) 8 (b) -8 (c) 1 (d) -1
- (13) If the curve of the function $f(x) = \log_a x$ passes through the point (8, 3), then $f(4) = \dots\dots\dots$
 (a) 1 (b) 2 (c) -2 (d) $\frac{1}{4}$
- (14) If ABC is a triangle in which $a - b = 4$ cm., $\sin A = \frac{3}{2} \sin B$, then $a = \dots\dots\dots$
 (a) 12 (b) 6 (c) 4 (d) 8
- (15) The number of possible solutions of triangle ABC in which $a = 6$ cm., $b = 9$ cm. and $m(\angle A) = 30^\circ$ is $\dots\dots\dots$
 (a) 0 (b) 1 (c) 2 (d) an infinite number.
- (16) In triangle LMN if $\frac{\sin M}{\sin N} = 2 \cos L$, then $\dots\dots\dots$
 (a) $m = n$ (b) $l = n$ (c) $l = m$ (d) $l = m = n$
- (17) In triangle XYZ, $xyz : \sin X \sin Y \sin Z = \dots\dots\dots$ (where r is radius of its circumcircle)
 (a) $2r$ (b) $8r$ (c) $8r^2$ (d) $8r^3$
- (18) In triangle DEF if $e = f$, then $\cos E = \dots\dots\dots$
 (a) $2e^2 : f$ (b) $d : 2f$ (c) $f : 4d$ (d) $e : 2d$
- (19) ABC is a triangle in which $a^2 + b^2 - c^2 + ab = 0$, then $m(\angle C) = \dots\dots\dots^\circ$
 (a) 30 (b) 60 (c) 120 (d) 150
- (20) $\lim_{x \rightarrow 1} \frac{3 - \sqrt{x+8}}{1 - x^2} = \dots\dots\dots$
 (a) $\frac{1}{2}$ (b) -4 (c) $\frac{1}{6}$ (d) $\frac{1}{12}$
- (21) If $\lim_{x \rightarrow 2} \frac{x^2 - 8x + m}{x^2 - 4} = k$, then $k + m = \dots\dots\dots$
 (a) 10 (b) 11 (c) 12 (d) 13
- (22) If $\lim_{x \rightarrow a} \frac{x^5 - a^5}{x^2 - a^2} = 20$, then $a = \dots\dots\dots$
 (a) 1 (b) 2 (c) 3 (d) 4

(23) If $m \in \mathbb{R}$, $\lim_{x \rightarrow \infty} \frac{(m+1)x^2 - x + 1}{(m+3)x^2 - 5x + 2} = -1$, then $m = \dots\dots\dots$

- (a) 1 (b) -1 (c) 2 (d) -2

(24) If $f(x) = \frac{3x+9}{|x+3|}$, then $(f(-3)^+)^2 - (f(-3)^-)^2 = \dots\dots\dots$

- (a) zero (b) 9 (c) 1 (d) 18

(25) If $\lim_{x \rightarrow 0} \frac{\tan mx}{kx} = 2$, $\lim_{x \rightarrow 0} \frac{\sin kx}{nx} = 3$, then $\frac{m}{n} = \dots\dots\dots$

- (a) 6 (b) $\frac{3}{2}$ (c) $\frac{2}{3}$ (d) 1

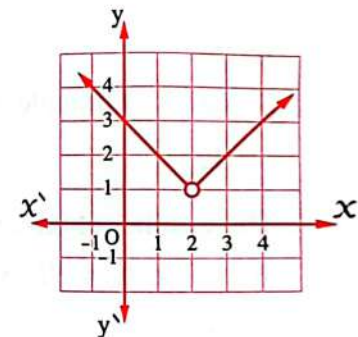
(26) If $\lim_{x \rightarrow \infty} (ax^3 + 3x - 5) = -\infty$, then a could be $\dots\dots\dots$

- (a) 2 (b) 3 (c) -4 (d) zero

(27) In the opposite figure :

$f(2) = \dots\dots\dots$

- (a) undefined
(b) 1
(c) zero
(d) 2



Second Essay questions

Answer the following questions :

1 Draw the curve of the function : $f(x) = 2 - (3x + 1)^2$ and from the graph find the range of the function and discuss its monotony.

2 Find the value of a and b which make the function f continuous at $x = 2$

$$\text{where } f(x) = \begin{cases} ax + b & , x > 2 \\ 3 & , x = 2 \\ b - ax^2 & , x < 1 \end{cases}$$

6 Alexandria Governorate



Montazah Zone

First Multiple choice questions

Choose the correct answer from those given :

(1) The domain of the function : $f(x) = \sqrt{x-3} = \dots\dots\dots$

- (a) $]3, \infty[$ (b) $[3, \infty[$ (c) $] -\infty, 3[$ (d) $] -\infty, 0[$



Interactive test 6

- (2) The even function of the following is $f(x) = \dots\dots\dots$
- (a) x^3 (b) $x \cos(x)$ (c) $x \sin(x)$ (d) $x + \cos(x)$
- (3) The solution set of the inequality: $\sqrt{x^2 - 6x + 9} < 2$ in $\mathbb{R}$ is $\dots\dots\dots$
- (a) $[1, 5]$ (b) $\mathbb{R} - \{1, 5\}$ (c) $]1, 5[$ (d) $\mathbb{R} -]1, 5[$
- (4) The function $f(x) = 3 - |x|$ is decreasing in $\dots\dots\dots f(x) : \mathbb{R} \longrightarrow \mathbb{R}$
- (a) $]3, \infty[$ (b) $]0, \infty[$ (c) $] - \infty, 3[$ (d) $] - \infty, 0[$
- (5) If $f(x) = 3x + 5$ and $g(x) = 2x + 7$, then the coefficient of x in $f(g(x)) = \dots\dots\dots$
- (a) 3 (b) 2 (c) 6 (d) 35
- (6) Express the following inequality: $x > 6, x < -6 = \dots\dots\dots$
- (a) $|x| < 6$ (b) $|x| > 6$ (c) $|x| < -6$ (d) $|x| > -6$
- (7) If $3^x = 2^y$, then $18^x = \dots\dots\dots$
- (a) 2^{x+2y} (b) 2^{2x+2y} (c) 2^{2x+2y} (d) 2^{x+y}
- (8) If $(2x - 1)^4 = 81$, then $x \in \dots\dots\dots$
- (a) $\{1\}$ (b) $\{1, -2\}$ (c) $\{2\}$ (d) $\{-1, 2\}$
- (9) If $3^{f(x)} = 2x - 1$, then $f^{-1}(0) = \dots\dots\dots$
- (a) 1 (b) -1 (c) 2 (d) 5
- (10) If $\log_x(3x - 2) = 2$, then $x \in \dots\dots\dots$
- (a) $\{2\}$ (b) $\{1\}$ (c) $\{1, 2\}$ (d) $\{3, 2\}$
- (11) The solution set of the equation: $3^{x+1} + 3^x = 12$ is $\dots\dots\dots$
- (a) $\{0\}$ (b) $\{1\}$ (c) $\{3\}$ (d) $\{0, 1\}$
- (12) If $\log_b a \times \log_a b = \dots\dots\dots$
- (a) ab (b) a^2b^2 (c) $a + b$ (d) 1
- (13) If $f(x) = 2^x$, then $\frac{f(x+1) + f(x)}{f(x-1)} = \dots\dots\dots$
- (a) 3 (b) 6 (c) 4 (d) 8
- (14) If $\log_3 x = 2$, then $\log_3(9x) + \log_6(4x) = \dots\dots\dots$
- (a) 3 (b) 4 (c) 5 (d) 6
- (15) If $h(x) = (f(x))^2 + 1$ and $\lim_{x \rightarrow 7} f(x) = 3$, then $\lim_{x \rightarrow 7} \frac{h(x)}{f(x)} = \dots\dots\dots$
- (a) 3 (b) $\frac{10}{3}$ (c) $\frac{8}{3}$ (d) 10

(16) $\lim_{x \rightarrow \infty} \frac{3kx}{4x+3} = 6$, then $k = \dots\dots\dots$

- (a) 6 (b) $\frac{3}{4}$ (c) 8 (d) 3

(17) If $f(x) = \begin{cases} \frac{\sin ax}{x} & , x > 0 \\ \cos 3x + 4 & , x < 0 \end{cases}$ has a limit at $x = 0$, then $a = \dots\dots\dots$

- (a) 7 (b) 12 (c) 5 (d) 3

(18) $\lim_{x \rightarrow 0} \left(\frac{6x}{\sin 2x} - \frac{\tan 10x}{\sin x} \right) = \dots\dots\dots$

- (a) -7 (b) 3 (c) 7 (d) -3

(19) $\lim_{x \rightarrow \infty} \frac{(3x+2)(2x-1)}{x(3x+4)} = \dots\dots\dots$

- (a) 2 (b) 3 (c) 6 (d) -2

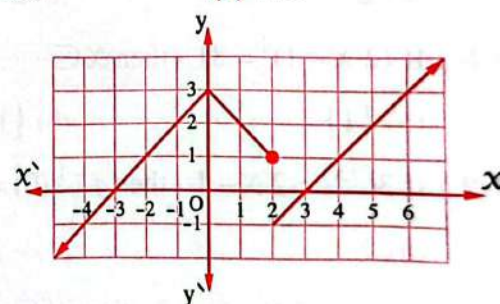
(20) $\lim_{x \rightarrow 2} \frac{x^7 - 128}{x - 2} = \dots\dots\dots$

- (a) 14 (b) 224 (c) 696 (d) 448

(21) In the opposite figure :

$\lim_{x \rightarrow 2} f(x) = \dots\dots\dots$

- (a) 3 (b) -1
(c) 1 (d) not exist.



(22) In a triangle ABC if : $3 \sin A = 2 \sin B = 4 \sin C$, then $a : b : c = \dots\dots\dots$

- (a) 4 : 6 : 3 (b) 3 : 4 : 6 (c) 6 : 4 : 3 (d) 3 : 2 : 4

(23) In ΔABC if : $\frac{a^2 + b^2 - c^2}{2ab} = \frac{a}{2r}$ where r is the radius of the circumcircle of the ΔABC , then the triangle ABC is $\dots\dots\dots$

- (a) equilateral. (b) obtuse. (c) acute. (d) right.

(24) In ΔABC if : $a^2 + b^2 - c^2 = 2abk$ where " k " is constant, then k could be $\dots\dots\dots$

- (a) $\frac{-1}{2}$ (b) -1 (c) 1 (d) 2

(25) ΔABC , $m(\angle A) = 60^\circ$, $m(\angle C) = 30^\circ$, $c = 6$ cm., then $b = \dots\dots\dots$

- (a) $6\sqrt{3}$ (b) 12 (c) 6 (d) $12\sqrt{3}$

(26) In ΔABC if : $b = 30$ cm., $c = 14$ cm., $m(\angle A) = 60^\circ$, then $a = \dots\dots\dots$ cm.

- (a) 26 (b) 14 (c) 28 (d) 24

(27) In ΔABC : $\frac{a}{2r} = \dots\dots\dots$ where r is the radius length of the circumcircle of the triangle ABC

- (a) $\sin A$ (b) $\cos A$ (c) $\tan A$ (d) $\sin B$

Second Essay questions

Answer the following questions :

- 1** Graph the curve of the function : $f(x) = \frac{1}{x-1} + 2$, then determine the domain , the range and the monotony of function.

- 2** If $f(x) = \begin{cases} \frac{x^2+6}{a} & , x < 3 \\ 3b & , x > 3 \end{cases}$ and $\lim_{x \rightarrow 3} f(x)$ is exist then find the value of a b.

7

Alexandria Governorate



Borg Al Arab Zone

First Multiple choice questions

Choose the correct answer from those given :



Interactive test 7

- (1)** The number of possible solutions of $\triangle XYZ$ in which $m(\angle X) = 30^\circ$, $x = 6$ cm. , $y = 9$ cm. is
- (a) 0 (b) 3 (c) 1 (d) 2
- (2)** If the area of $\triangle XYZ = 12 \text{ cm}^2$, $x = 8$ cm. , $m(\angle Y) = 30^\circ$, then $z = \dots\dots\dots$ cm.
- (a) 4 (b) 8 (c) 6 (d) 12
- (3)** In $\triangle XYZ$ if : $2 \sin X = 3 \sin Y$, $YZ = 12$ cm. , then $XZ = \dots\dots\dots$ cm.
- (a) 12 (b) 8 (c) 3 (d) 2
- (4)** If the area of $\triangle ABC = 24 \text{ cm}^2$ and the length of the radius of circumcircle $= \sqrt{12}$ cm. , then $\sin(A) \sin(B) \sin(A+B) = \dots\dots\dots$
- (a) 1 (b) 6 (c) 12 (d) 24
- (5)** In $\triangle XYZ$ if : $x^2 = y^2 + z^2 + yz$, then $m(\angle X) = \dots\dots\dots^\circ$
- (a) 120 (b) 150 (c) 60 (d) 30
- (6)** In $\triangle XYZ$ if : $x = 30$ cm. , $y = 14$ cm. , $m(\angle Z) = 60^\circ$, then $z = \dots\dots\dots$ cm.
- (a) 16 (b) 26 (c) 15 (d) 17
- (7)** If f is one-to-one function in which $f(5-3k) = f(k-3)$, then $k = \dots\dots\dots$
- (a) 3 (b) 5 (c) 2 (d) 8
- (8)** If f and g are two functions where $f(x) = 4x - 12$, $g(x) = ax + 3$ and each one of them is inverse function of other , then $a = \dots\dots\dots$
- (a) -4 (b) 4 (c) 3 (d) 0.25

- (9) If $f(x) = 3x + 2$, $g(x) = 2x + k$ and $(f \circ g)(x) = (g \circ f)(x)$, then $k = \dots\dots\dots$
 (a) 4 (b) 3 (c) 1 (d) 4
- (10) The domain of the function $f(x) = \sqrt{x-5} + \sqrt{5-x}$ is $\dots\dots\dots$
 (a) $]-5, 5[$ (b) $\{5\}$ (c) $\{-5, 5\}$ (d) $[-5, 5[$
- (11) If f is even function its domain $[5 - k, 2k - 7]$, then $k = \dots\dots\dots$
 (a) 2 (b) 4 (c) 10 (d) 12
- (12) The solution set of the inequality: $|x - 3| - 3|x - 3| > 2$ is $\dots\dots\dots$
 (a) $]1, -1]$ (b) $\emptyset$ (c) $\mathbb{R}$ (d) $]2, 4[$
- (13) If $7^x = 4$, $4^y = 49$, then $xy = \dots\dots\dots$
 (a) 20 (b) 2 (c) 7 (d) 4
- (14) The solution set of the equation: $2x + \sqrt{25x} - 3 = 0$ is $\dots\dots\dots$
 (a) $\{-2, 3\}$ (b) $\{2, 3\}$ (c) $\{0.25, 9\}$ (d) $\{0.25\}$
- (15) If $f(x) = 2^x$, $f(x+1) - f(x-1) = 24$, then $x = \dots\dots\dots$
 (a) 3 (b) 16 (c) 4 (d) 8
- (16) If L, M are two roots of the equation: $x^2 - 5x + 4 = 0$, then $\log_2(L) + \log_2(M) = \dots\dots\dots$
 (a) 2 (b) 4 (c) 12 (d) 16
- (17) If $f(x) = \log_b(2x + 4)$ and $f^{-1}(5) = 14$, then $b = \dots\dots\dots$
 (a) 2 (b) 4 (c) 6 (d) 7
- (18) An amount of 5000 pounds is deposited in a bank gives a yearly compound interest 5 % for 7 years $\approx \dots\dots\dots$ pounds.
 (a) 7035.5 (b) 6750 (c) 8500 (d) 5350
- (19) If $x^{\log x} = 10$, then $x = \dots\dots\dots$
 (a) $\{10, 3\}$ (b) $\{10, 0.1\}$ (c) $\{0.2, 10\}$ (d) $\{1.25\}$
- (20) $\lim_{x \rightarrow \infty} (x^2 - x^3 + 3) = \dots\dots\dots$
 (a) 3 (b) -1 (c) $-\infty$ (d) ∞
- (21) If $\lim_{x \rightarrow 5} f(x) = 4$, then $\lim_{x \rightarrow 5} (f(x) - 4) = \dots\dots\dots$
 (a) 8 (b) 5 (c) 4 (d) 0
- (22) $\lim_{x \rightarrow -1} \frac{x^2 + kx + m}{x^2 - 1} = 3$, then $k + m = \dots\dots\dots$
 (a) -4 (b) -5 (c) -9 (d) -8
- (23) $\lim_{x \rightarrow 3} \frac{2x^2 - 5x - 3}{2x^2 - 3x - 9} = \dots\dots\dots$
 (a) $\frac{5}{9}$ (b) $\frac{7}{9}$ (c) 2 (d) 9

- (24) $\lim_{x \rightarrow 1} \frac{\sqrt{x+3} - 2}{x^2 - 1} = \dots\dots\dots$
 (a) 2 (b) 0.25 (c) 0.125 (d) 8
- (25) $\lim_{x \rightarrow -2} \frac{x^7 + 128}{x^4 - 16} = \dots\dots\dots$
 (a) -14 (b) 14 (c) -9 (d) 9
- (26) $\lim_{x \rightarrow \infty} (\sqrt{x^2 + 4x} - x) = \dots\dots\dots$
 (a) 2 (b) 4 (c) -1 (d) -2
- (27) $\lim_{x \rightarrow 0} (6x \csc 3x) = \dots\dots\dots$
 (a) 9 (b) 4 (c) 2 (d) 18

Second Essay questions

Answer the following questions :

- 1 Draw the curve of the function $f(x) = |x^2 - 2|$ and determine its range and type whether it is even , odd or otherwise.
- 2 Discuss the continuity of the function : $f(x) = |x - 1| - 2$ at $x = 1$

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El-Kalyoubia Governorate



Mathematics Inspection

First Multiple choice questions

Choose the correct answer from those given :



Interactive test 8

- (1) The domain of the function f where $f(x) = \sqrt[4]{x-4}$ is
 (a) $\mathbb{R}$ (b) $\mathbb{R} - \{4\}$ (c) $\mathbb{R} - [-2, 2]$ (d) $[4, \infty[$
- (2) If $f(x) = 2x$, $g(x) = \frac{1}{2x}$, $f(g(x)) = 4$, then $x = \dots\dots\dots$
 (a) $\frac{1}{6}$ (b) 6 (c) 4 (d) $\frac{1}{4}$
- (3) If f is a function where $f :]-3, 3] \longrightarrow \mathbb{R}$, $f(x) = x^2 + 1$, then the function $f(x)$ is
 (a) even. (b) odd. (c) one-to-one. (d) neither odd nor even.
- (4) The range of the function $f : f(x) = \frac{1}{|x|}$ is
 (a) $\mathbb{R} - \{0\}$ (b) $]0, \infty[$ (c) $[0, \infty[$ (d) $\{0\}$
- (5) The solution set of the inequality : $|x - 1| > 0$
 (a) $\mathbb{R} - \{1\}$ (b) $] - \infty, 1[$ (c) $] - 1, \infty[$ (d) $\{1\}$

(6) All the following functions are one-to-one except

- (a) $f(x) = x + 3$ (b) $f(x) = x^3 + 2$ (c) $f(x) = 2^x$ (d) $f(x) = \sin x$

(7) If $3^{x-2} = \sqrt[4]{27}$, then $x =$

- (a) $\frac{11}{4}$ (b) $\frac{4}{3}$ (c) $\frac{3}{4}$ (d) 6

(8) The straight line $y = 8$ cuts the curve of the function $f : f(x) = 2^x$ at the point

- (a) (0, 1) (b) (2, 0) (c) (2, 8) (d) (3, 8)

(9) The image of the point $(-1, 4)$ by reflection in the straight line $y = x$ is

- (a) $(-1, 4)$ (b) $(4, -1)$ (c) $(1, 4)$ (d) $(1, -4)$

(10) If $\log_5 \sqrt{x+1} = \frac{1}{2}$, then $x =$

- (a) 2 (b) 4 (c) 5 (d) 6

(11) The function $f : f(x) = \log_a x$ is decreasing for every $a \in$

- (a) $]0, \infty[$ (b) $]-\infty, 0[$ (c) $]0, 1[$ (d) $]1, \infty[$

(12) $\frac{1}{\log_3 24} + \frac{1}{\log_2 24} + \frac{1}{\log_4 24} =$

- (a) 1 (b) 2 (c) 4 (d) 24

(13) The solution set of the equation : $\log x^2 - (\log x)^2 = 0$

- (a) $\{1\}$ (b) $\{1, 10\}$ (c) $\{1, 100\}$ (d) $\{100\}$

(14) $\lim_{x \rightarrow 0} \frac{2x + 5x^{-2}}{3x + x^{-2}} =$

- (a) $\frac{2}{3}$ (b) $\frac{10}{3}$ (c) $\frac{5}{3}$ (d) 5

(15) $\lim_{x \rightarrow 0} \frac{8 + 7x}{\cos x} =$

- (a) 7 (b) 8 (c) 9 (d) 15

(16) If $\lim_{x \rightarrow a} \frac{x^8 - a^8}{x^6 - a^6} = 48$, then $a =$

- (a) 4 (b) 6 (c) ± 4 (d) ± 6

(17) $\lim_{x \rightarrow \infty} \frac{1}{x} \sqrt{9 + 16x^2} =$

- (a) $2\sqrt{2}$ (b) 3 (c) -3 (d) 4

(18) $\lim_{x \rightarrow 0} \frac{1 - \cos x + \sin 6x}{1 - \cos x + \tan 3x} =$

- (a) 0 (b) 2 (c) $\frac{3}{6}$ (d) 18

- (19) If $f(x) = \begin{cases} \frac{\tan 2x}{\log_3 27^x} & , \quad -\frac{\pi}{4} < x < 0 \\ x + \frac{2}{3} & , \quad x > 0 \end{cases}$, then $\lim_{x \rightarrow 0} f(x) = \dots\dots\dots$
- (a) 3 (b) $\frac{2}{3}$ (c) $\frac{3}{2}$ (d) does not exist

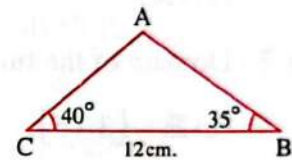
- (20) If $m \in \mathbb{R}$ and $\lim_{x \rightarrow \infty} \frac{(m+5)x^3 - x + 4}{3mx^3 - 2x + 9} = 2$, then $m = \dots\dots\dots$

- (a) 0 (b) $\frac{5}{3}$ (c) $\frac{4}{9}$ (d) 1
- (21) $\lim_{x \rightarrow 0} \frac{\sqrt{x+1} - 1}{x} = \dots\dots\dots$
- (a) 0 (b) $\sqrt{2}$ (c) $\frac{1}{2}$ (d) does not exist

- (22) In the opposite figure :

The length of $\overline{AB} \approx \dots\dots\dots$ cm.

- (a) 6 (b) 7
(c) 8 (d) 9



- (23) In acute angled triangle ABC, $2a = \frac{b}{\sin B}$, then $m(\angle A) = \dots\dots\dots^\circ$
- (a) 30 (b) 45 (c) 60 (d) 75
- (24) If the radius length of circumcircle of ΔABC equals 4 cm. and $\sin A + \sin B + \sin C = 3$, then the perimeter of $\Delta ABC = \dots\dots\dots$ cm.
- (a) 6 (b) 8 (c) 12 (d) 24
- (25) In ΔABC , if $5 \sin A \sin B = 6 \sin B \sin C = 9 \sin C \sin A$, then $m(\angle C) \approx \dots\dots\dots^\circ$
- (a) 28 (b) 32 (c) 35 (d) 42
- (26) In ΔABC , if $a = 4$ cm. , $b = 4\sqrt{3}$ cm. , $m(\angle C) = 30^\circ$ cm. , then $c = \dots\dots\dots$ cm.
- (a) 3 (b) 4 (c) 10 (d) 16
- (27) In ΔABC , $a = 15$ cm. , $m(\angle B) = 30^\circ$, has a unique solution, then b could not be $\dots\dots\dots$ cm.
- (a) 15 (b) 30 (c) 7.5 (d) 8.5

Second Essay questions

Answer the following questions :

- 1 Draw the curve of the function f and determine the maximum value and monotonicity if : $f(x) = |x^2 - 4x - 5|$, $x \in [-1, 5]$

- 2** Discuss the continuity of the function defined by the following rule on its domain

$$f(x) = \begin{cases} x^2 - 3x + 2 & , x \leq 3 \\ 2 & , 3 < x \leq 4 \\ 6 - x^2 & , x > 4 \end{cases}$$

9**El-Sharkia Governorate****Diarbneq Directorate****First****Multiple choice questions**Interactive
test 9

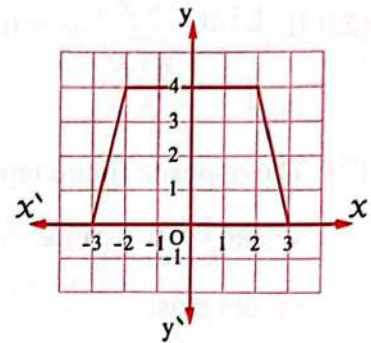
Choose the correct answer from those given :

- (1) If the function $f(x) = x^3$, $g(x) = \sqrt[3]{x}$, then : $(f \circ g)(x) = \dots\dots\dots$
 (a) $|x|$ (b) x (c) x^3 (d) $\sqrt[3]{x}$
- (2) Domain of the function : $f(x) = \frac{3}{x-5} + 1$ is $\dots\dots\dots$
 (a) $\mathbb{R} - \{3, 5\}$ (b) $\mathbb{R} - \{1, 5\}$ (c) $\mathbb{R} - \{5\}$ (d) $\mathbb{R} - \{1\}$
- (3) Range of the function : $f(x) = -|x-1| + 3$ is $\dots\dots\dots$
 (a) $[3, \infty[$ (b) $[1, \infty[$ (c) $]-\infty, 1]$ (d) $]-\infty, 3]$
- (4) If the function $f(x) = 3^{x+1}$, then S.S. of the equation : $f(x-1) = 9$ in $\mathbb{R}$ is $\dots\dots\dots$
 (a) $\{2\}$ (b) $\{\text{zero}\}$ (c) $\{4\}$ (d) $\{9\}$
- (5) Domain of the function : $f(x) = \log_{(-x)}(x+3)$ is $\dots\dots\dots$
 (a) $]-3, 0[$ (b) $]-3, 0[- \{-1\}$ (c) $]-\infty, 0[$ (d) $]-3, \infty[$
- (6) If the function : $y = 3x + 5$, then its inverse function is $y = \dots\dots\dots$
 (a) $5x - 3$ (b) $\frac{x-3}{5}$ (c) $\frac{x-5}{3}$ (d) $3x - 5$
- (7) The curve of the function $f(x) = \log_3(x-3)$ intersects x -axis at the point $\dots\dots\dots$
 (a) $(3, 3)$ (b) $(3, 0)$ (c) $(4, 0)$ (d) $(3, 4)$
- (8) S.S. of the equation : $x^{\frac{4}{3}} - 8x^{\frac{2}{3}} - 9 = 0$ in $\mathbb{R}$ is $\dots\dots\dots$
 (a) $\{1, 27\}$ (b) $\{-1, 27, -27\}$ (c) $\{27, -27\}$ (d) $\{ \}$
- (9) If $x \in \mathbb{R}^+$ where $\log_7(x) \times \log_3(7) = 3$, then $\log_3(x) = \dots\dots\dots$
 (a) 21 (b) 10 (c) 4 (d) 3
- (10) If $\log a^3 + 3 \log b - \log c^{-3} = 3$, then : $a b c = \dots\dots\dots$
 (a) 3 (b) 30 (c) 10 (d) 1000
- (11) S.S. of the inequality : $\sqrt{x^2 - 2x + 1} \geq 4$ in $\mathbb{R}$ is $\dots\dots\dots$
 (a) $]-3, 5[$ (b) $\mathbb{R} - [-3, 5]$ (c) $\mathbb{R} -]-3, 5[$ (d) $[-3, 5]$

(12) The opposite figure represents curve of function $f(x)$

all the following statements are true except :

- (a) $f(x)$ is even
- (b) increase in $]-3, -2[$
- (c) $f(x)$ is one-to-one
- (d) decrease in $]2, 3[$



(13) If the function $f(x) = \log(x)$, then S.S. of the equation : $f(x+8) - f(x-1) = 1$ in $\mathbb{R}$

- (a) $\{1\}$
- (b) $\{9\}$
- (c) $\{10\}$
- (d) $\{2\}$

(14) Area of circumcircle of triangle ABC where $\csc(A) = 10$ equals area unit.

- (a) 25π
- (b) 100π
- (c) 5π
- (d) 10π

(15) In $\triangle ABC$: $b = 8$ cm. , $c = 10$ cm. $\cos A = \frac{2}{5}$, then $\triangle ABC$ is

- (a) right.
- (b) equilateral.
- (c) isosceles.
- (d) scalene.

(16) Number of solutions of $\triangle ABC$: $a = 5$ cm. , $b = 6$ cm. , $m(\angle A) = 30^\circ$ is

- (a) zero
- (b) 1
- (c) 2
- (d) 3

(17) In $\triangle ABC$ which of the following statement is always true :

- (a) $\sin A + \cos B = a + b$
- (b) $c = a \sin C$
- (c) $a \sin B = b \sin A$
- (d) $a = b \sin C$

(18) In $\triangle ABC$: $a = 5$ cm. , $b = 3$ cm. , $m(\angle C) = 120^\circ$, then $c =$ cm.

- (a) 6
- (b) 7
- (c) 8
- (d) 9

(19) In $\triangle ABC$: $\sin A + \sin C = 4 \sin B$, its perimeter = 35 cm. , then $b =$ cm.

- (a) 7
- (b) 8
- (c) 9
- (d) 10

(20) If $\lim_{x \rightarrow 3} \frac{x^n - 81}{x - 3} = m$, then $n + m =$

- (a) 112
- (b) 108
- (c) 27
- (d) 7

(21) If the function $f(x) = \begin{cases} \frac{\sin(ax)}{x} & , x > 0 \\ \frac{5x+6}{x+3} & , x < 0 \end{cases}$ has limit at $x \rightarrow 0$, then $a =$

- (a) 2
- (b) -2
- (c) -5
- (d) 5

(22) If $\lim_{x \rightarrow 0} \frac{x^2 + \tan^2(ax)}{x^2} = 10$, then $a =$

- (a) $\sqrt{10}$
- (b) 9
- (c) ± 9
- (d) ± 3

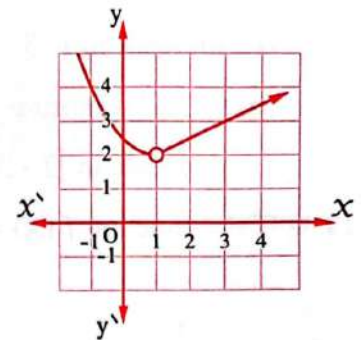
(23) If $\lim_{x \rightarrow \infty} \frac{kx+7}{\sqrt{4x^2+3}} = 0.5$, then $k = \dots\dots\dots$

- (a) 4 (b) 2 (c) 1 (d) 0.5

(24) The opposite figure represents function $f(x)$

, then $\lim_{x \rightarrow 1} f(x) = \dots\dots\dots$

- (a) not exist. (b) zero.
(c) 1 (d) 2



(25) If $\lim_{x \rightarrow 0} \frac{(x+1)^9 - k^9}{x} = m$, then $k + m = \dots\dots\dots$

- (a) 10 (b) 9 (c) 8 (d) 0

(26) If the function $f(x) = \begin{cases} \frac{x^2-1}{x-1} & , x \neq 1 \\ k & , x = 1 \end{cases}$ continuous at $x = 1$, then $k = \dots\dots\dots$

- (a) 2 (b) -2 (c) -1 (d) 1

(27) The function $f(x) = \frac{x^2-5x}{\sqrt{x-2}-1}$ is continuous on interval $\dots\dots\dots$

- (a) $[2, \infty[$ (b) $]2, \infty[$ (c) $[2, \infty[- \{3\}$ (d) $]2, \infty[- \{3\}$

Second Essay questions

Answer the following questions :

1 Draw the curve of $f(x) = \begin{cases} |x|^2 & , x \geq 0 \\ \frac{1}{x} & , x < 0 \end{cases}$, then from graph find increase and decrease intervals.

2 Find : $\lim_{x \rightarrow -2} \frac{(x+3)^5 - 1}{x^2 - 4}$

10 El-Monofia Governorate



Shebin El-Kom Educational Directorate
Mathematics Supervision

First Multiple choice questions

Choose the correct answer from those given :

(1) If $f(x) = x - 5$, $g(x) = |x^2 - 5|$, then $(f \circ g)(0) = \dots\dots\dots$

- (a) 0 (b) 2 (c) 10 (d) undefined.



Interactive
test 10

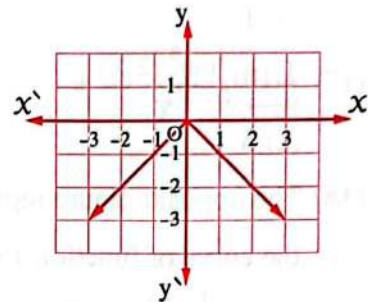
(2) The domain of the function $f(x) = \sqrt{x^2 - 25}$ is

- (a) $\mathbb{R} - \{5\}$ (b) $\mathbb{R} -]-5, 5[$ (c) $] -5, 5[$ (d) $[-5, 5]$

(3) Which of the following functions is an even function

- (a) $f(x) = x^2 + \sin^2 x$ (b) $f(x) = x + \cos x$
(c) $f(x) = x^3$ (d) $f(x) = x^4 + \sin x$

(4) The opposite figure represents the curve of the function $f(x)$ which of the following is true ?



- (a) range of f is $] -\infty, \infty[$
(b) domain of f is $]0, \infty[$
(c) f is increasing on $]0, \infty[$
(d) f is not one-to-one function

(5) The solution set of the equation : $3^{2x} + 12 \times 3^x + 27 = 0$ in $\mathbb{R}$ is

- (a) $\{-9, -3\}$ (b) $\{1, 2\}$ (c) $\{-1, -2\}$ (d) $\emptyset$

(6) The solution set of the equation : $|2x + 6| = \sqrt{x^2}$ in $\mathbb{R}$ is

- (a) $\{-6, -2\}$ (b) $\{6, 2\}$ (c) $\{-1, 3\}$ (d) $\emptyset$

(7) The value of : $\log_6 \log_{\sqrt{3}} 27 =$

- (a) -6 (b) -3 (c) 3 (d) 1

(8) $\sqrt[4]{81x^8y^{12}} =$

- (a) $3|x^2|y^3$ (b) $|3|x^2y^3|$ (c) $3x^2|y^3|$ (d) $3x^2y^3$

(9) If $f(x) = \frac{1}{2}x - 6$, then $f^{-1}(12) =$

- (a) 6 (b) 12 (c) 24 (d) 36

(10) If $\log A = x$, $\log B = y$ where $A > 0$, $B > 0$, then $\log AB =$

- (a) $A + B$ (b) $x + y$ (c) xy (d) $(x)^y$

(11) The intersection point of the curve of the function $f(x) = 3^x + 5$ with y-axis is

- (a) (1, 0) (b) (0, 5) (c) (0, 6) (d) (1, 8)

(12) If $\log_2 2x + \log_2 x = 5$, then $x =$

- (a) 5 (b) ± 5 (c) 4 (d) ± 4

(13) The solution set of equation : $(4)^{x-3} = (8)^{2x-6}$ is

- (a) $\{3\}$ (b) $\{0\}$ (c) $\{4\}$ (d) $\{5\}$

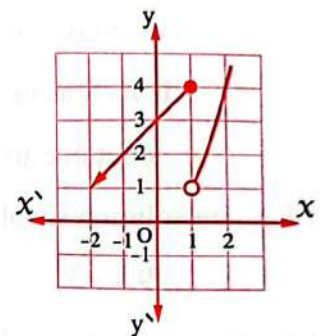
- (14) $\lim_{x \rightarrow 2} 5a = \dots\dots\dots$
 (a) $5a$ (b) 10 (c) $10a$ (d) does not exist.

- (15) $\lim_{x \rightarrow 0} \left(\frac{(x+2) \sin 12x}{3x} + \frac{1 - \cos x}{x} \right) = \dots\dots\dots$
 (a) 1 (b) 4 (c) 8 (d) does not exist.

- (16) $\lim_{x \rightarrow \infty} \frac{A}{x^n} = \dots\dots\dots$ where $A \in \mathbb{R}, n > 0$
 (a) 1 (b) does not exist (c) ∞ (d) 0

- (17) $\lim_{x \rightarrow 0} \frac{\tan^3(2x)}{x^2} = \dots\dots\dots$
 (a) 8 (b) 2 (c) 4 (d) 0

- (18) The opposite figure represents the curve of function $f(x)$:
 , then $\lim_{x \rightarrow 1^+} f(x) = \dots\dots\dots$
 (a) 1 (b) 2
 (c) 3 (d) does not exist.



- (19) $\lim_{x \rightarrow \infty} \frac{\sqrt{16x^2 - 5x}}{2x - 4} = \dots\dots\dots$
 (a) 2 (b) -2 (c) 8 (d) -8

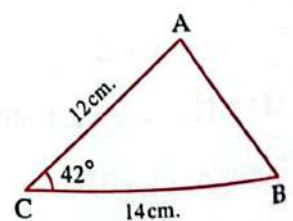
- (20) $\lim_{x \rightarrow b} \frac{x^2 - b^2}{b - x} = \dots\dots\dots$
 (a) b (b) $2b$ (c) $-2b$ (d) $-b$

- (21) $\lim_{x \rightarrow 2} \frac{3x^5 - 96}{x^3 - 8} = \dots\dots\dots$
 (a) 20 (b) 60 (c) 96 (d) 32

- (22) In $\triangle XYZ$ the expression $2r(\sin X + \sin Y) = \dots\dots\dots$
 (a) $x + y$ (b) $y + z$ (c) z (d) perimeter of $\triangle XYZ$

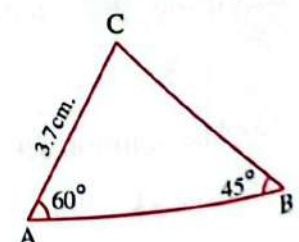
- (23) In the opposite figure the surface area of $\triangle ABC$ to the nearest tenth = $\dots\dots\dots \text{cm}^2$

- (a) 65.2 (b) 56.2
 (c) 84.0 (d) 13



- (24) In $\triangle ABC$, then $a \approx \dots\dots\dots \text{cm}$.

- (a) 4.53 (b) 5.29
 (c) 5.48 (d) 5.79



(25) The side lengths of triangle 4 cm. , 5 cm. , 6 cm. , then $\cos (X) = \dots\dots\dots$
where (X is the measure of the greatest angle in the triangle)

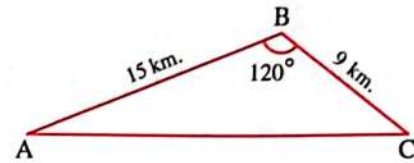
- (a) $\frac{1}{2}$ (b) $\frac{-1}{8}$ (c) $\frac{9}{16}$ (d) $\frac{1}{8}$

(26) The perimeter of the opposite triangle = km.

- (a) 21 (b) 30
(c) 45 (d) 24

(27) In any $\Delta LMN : l^2 + m^2 - n^2 = 2 l m \times \dots\dots\dots$

- (a) $2 \cos N$ (b) $\sin N$ (c) $\cos N$ (d) $\cos M$



Second Essay questions

Answer the following questions :

1 Represent graphically the function $f : f(x) = |x|$, then use the graph of function f to represent the function $h(x) = -|x - 5| + 2$, then determine the range of $h(x)$

2 If the function $f : f(x) = \begin{cases} kx - 1 & , x > 3 \\ 5 & , x = 3 \\ x^2 + h & , x < 3 \end{cases}$ is continuous on $\mathbb{R}$, then what is the value of each of k and h ?

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First Multiple choice questions

Choose the correct answer from those given :

(1) ΔABC in which : $3 \sin A = 4 \sin B = 2 \sin C$, its perimeter = 39 cm. , then the length of $\overline{BC}$ is cm.

- (a) 12 (b) 9 (c) 18 (d) 16

(2) ΔABC where $m(\angle B) = 30^\circ$, $c = 9$ cm. , $b = 7$ cm. , then $m(\angle A)$ to nearest degree is

- (a) 110° (b) 140° (c) 40° (d) 10° or 110°

(3) ΔABC in which : $\frac{\sin A}{2} = \frac{\sin B}{3} = \frac{\sin C}{4}$, then $m(\angle C) = \dots\dots\dots^\circ$ to nearest degree.

- (a) 104 (b) 76 (c) 103 (d) 77

(4) ABCD is a quadrilateral in which $AB = 3$ cm. , $BC = 7$ cm. , $CD = 5$ cm. , $AC = BD = 8$ cm. , then ABCD is

- (a) cyclic quadrilateral. (b) square. (c) rectangle. (d) rhombus.

- (5) LMN is a triangle, $m(\angle L) = 30^\circ$, $l = 6$ cm, $m = 9$ cm, then the number of triangles that satisfies this conditions is
- (a) 0 (b) 1
(c) 2 (d) the information is not enough.
- (6) ΔABC if : $a^2 + b^2 - c^2 = \sqrt{3} ab$, then $m(\angle C) = \dots\dots\dots$
- (a) 30° (b) 60° (c) 12° (d) 150°
- (7) The function $f(x) = \frac{|2+x| - |2-x|}{|2+x| + |2-x|}$ is
- (a) odd. (b) even.
(c) even and odd. (d) neither even nor odd.
- (8) The solution set of the inequality : $|2x - 6| + |3 - x| > 12$ is
- (a) $]-1, 7[$ (b) $\mathbb{R} - [3, 9]$ (c) $\mathbb{R} - [-1, 7]$ (d) $\mathbb{R} - [3, 9[$
- (9) The range of the function $f : [-2, 3[\longrightarrow \mathbb{R}$, $f(x) = x^2$ is
- (a) $[4, 9[$ (b) $\mathbb{R}^+$ (c) $[0, 9[$ (d) $[0, 4]$
- (10) If $f(x)$ is one-to-one function : $f(x)$ could be =
- (a) $\sin x$ (b) $\cos x$ (c) $\tan x$ (d) x
- (11) If f is increasing function on the interval $]1, \infty[$, then $g(x) = f(x+2)$ is increasing on
- (a) $]-1, \infty[$ (b) $]-\infty, 1[$ (c) $]-2, \infty[$ (d) $]-3, \infty[$
- (12) If $f(x) = 2x + 1$, $g(x) = x^2 - 3$, then $(f \circ g)(x) = \dots\dots\dots$
- (a) $2x^2 + 5$ (b) $4x^2 + 4x - 2$ (c) $4x + 3$ (d) $2x^2 - 5$
- (13) If $2^{x+1} + 2^{x+3} = 80$, then $x = \dots\dots\dots$
- (a) 8 (b) 10 (c) 3 (d) 2
- (14) The range of $f^{-1} : f(x) = \log_{(1-x)} x$ is
- (a) $x \geq 0$ (b) $0 < x < 1$ (c) $x < 1$ (d) $0 \leq x \leq 1$
- (15) If $5^x + \frac{125}{5^x} = 10^{\log 30}$, then $x = \dots\dots\dots$
- (a) 2 (b) 1 (c) 2 or 1 (d) 21
- (16) If $\log_3 x \times \log_2 3 = 5$, such that $x \in \mathbb{R}^+$, then $x = \dots\dots\dots$
- (a) 2 (b) 32 (c) 5 (d) 3
- (17) $5^{x-2} = 3 \times 4^{x+1}$, then $x \approx \dots\dots\dots$ to nearest two decimal digits.
- (a) 25.56 (b) 25.65 (c) 25.67 (d) 25.76

(18) The solution set of $\log x - \log_x 100 = 1$ is

- (a) $\{1, 10\}$ (b) $\{10, 0.1\}$ (c) $\{100, 0.1\}$ (d) $\{1, \infty\}$

(19) The function $f : f(x) = a^x$ is increasing on its domain if

- (a) $a > 0$ (b) $a > 1$ (c) $a = 1$ (d) $0 < a < 1$

(20) $\lim_{x \rightarrow -3} \frac{x^2 + 4x + 3}{x^2 - 9} = \dots\dots\dots$

- (a) 1 (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d) $\frac{1}{2}$

(21) If $f(x) = x + 1$, $g(x) = \frac{x^2 - 1}{x - 1}$, $\lim_{x \rightarrow 1} (f \circ g)(x) = \dots\dots\dots$

- (a) 1 (b) 2 (c) -2 (d) 3

(22) $\lim_{x \rightarrow \infty} \frac{x^3 + 5}{x(2x^2 + 3)} = \dots\dots\dots$

- (a) $\frac{5}{3}$ (b) $\frac{5}{2}$ (c) $\frac{1}{2}$ (d) 1

(23) $\lim_{x \rightarrow 3} \frac{x^2 - k^2}{x + 3} = \frac{4}{3}$, then $k = \dots\dots\dots$

- (a) ± 2 (b) ± 9 (c) ± 1 (d) ± 3

(24) $\lim_{x \rightarrow 0} \frac{2x + \sin 3x}{\tan 5x} = \dots\dots\dots$

- (a) 0 (b) 1 (c) 5 (d) $\frac{6}{5}$

(25) $\lim_{x \rightarrow \infty} \frac{ax + 6}{2x + 7} = 4$, $a \in \mathbb{R}$, then $a = \dots\dots\dots$

- (a) 2 (b) 4 (c) 6 (d) 8

(26) $\lim_{x \rightarrow 0} \frac{\sin x}{x} = \dots\dots\dots$ where x is in degree measure.

- (a) 1 (b) $\frac{\pi}{180}$ (c) $\frac{180}{\pi}$ (d) π

(27) If $f(x) = \begin{cases} 3x^2 + ax - 2 & , \quad x > 3 \\ 2x + b & , \quad x < 3 \end{cases}$, $\lim_{x \rightarrow 3} f(x) = 16$, then $a + b = \dots\dots\dots$

- (a) 4 (b) 10 (c) -13 (d) 7

Second Essay questions

Answer the following questions :

1 Graph the function $f : f(x) = x|x| + 2$ and from the graph find the range, its symmetry, state whether the function is even, odd or otherwise, is the function one-to-one? and show monotony.

2 If the function $f : f(x) = \begin{cases} 3x - 2 & , \quad x \leq -2 \\ ax + b & , \quad -2 < x < 5 \\ x^2 - 12 & , \quad x \geq 5 \end{cases}$ is continuous in $\mathbb{R}$, find each of a, b


First Multiple choice questions

Choose the correct answer from the given ones :

- (1) The point of symmetry of the curve of the function $f : f(x) = \frac{1}{x-3} + 4$ is
- (a) (3, -4) (b) (-3, -4) (c) (3, 4) (d) (4, -3)
- (2) The domain of function $f : f(x) = \sqrt{x-3}$ is
- (a) $\mathbb{R} - \{3\}$ (b) $[3, \infty[$ (c) ± 3 (d) $\mathbb{R}$
- (3) If $f(x) = \sqrt[3]{x}$, $g(x) = x^3$, then $(f \circ g)(x) = \dots\dots\dots$
- (a) x (b) $|x|$ (c) $-x$ (d) $\sqrt[3]{x}$
- (4) The even function from the following functions that are defined by the following rules is
- (a) $f(x) = \cos x$ (b) $f(x) = \tan x$
(c) $f(x) = x^2 \sin x$ (d) $f(x) = x^3$
- (5) The axis of symmetry of the function $f : f(x) = x^2$ is the straight line
- (a) $y = 0$ (b) $y = x$ (c) $x = 0$ (d) $y = -x$
- (6) The solution set of the equation : $|x - 2| = 3$ is
- (a) $\{2, 3\}$ (b) $[-1, 5]$ (c) $\{-1, 5\}$ (d) $\{-5, 5\}$
- (7) If $5^{x-1} = 4^{x-1}$, then $x = \dots\dots\dots$
- (a) 2 (b) 1 (c) 0 (d) 4
- (8) If the exponential function of base a is increasing where $f : f(x) = a^x$, then
- (a) $a > 0$ (b) $0 < a < 1$ (c) $a > 1$ (d) $a = 1$
- (9) If f is a function where $f(x) = x^3 + 7$, then $f^{-1}(-1) = \dots\dots\dots$
- (a) 1 (b) -2 (c) 2 (d) 8
- (10) If $x^{\frac{3}{2}} = 64$, then $x = \dots\dots\dots$
- (a) 512 (b) 4 (c) 16 (d) 2
- (11) If $\log(x + 1) = 3$, then $x = \dots\dots\dots$
- (a) -9 (b) 99 (c) 999 (d) -99

- (12) $1 - \log 2 = \dots\dots\dots$
 (a) $\log 5$ (b) $\log 20$ (c) $\log 2$ (d) $-\log 5$
- (13) $\frac{3 \log 2}{\log 4 + \log 3} = \dots\dots\dots$
 (a) $\log_3 2$ (b) $\log_{12} 8$ (c) $\log_7 2$ (d) $\log_7 8$
- (14) $\lim_{x \rightarrow 2} (1 - 3x) = \dots\dots\dots$
 (a) -2 (b) 5 (c) -5 (d) 0
- (15) $\lim_{x \rightarrow 3} \frac{x^2 - x - 6}{x^2 + x - 12} = \dots\dots\dots$
 (a) $\frac{5}{7}$ (b) -1 (c) $\frac{1}{7}$ (d) -5
- (16) $\lim_{x \rightarrow \infty} \frac{8x^3 + 3x + 4}{x^3 - 3} = \dots\dots\dots$
 (a) 4 (b) 6 (c) 8 (d) 12
- (17) If $\lim_{x \rightarrow 4} \frac{x^2 - a}{x - 4}$ exists, then $a = \dots\dots\dots$
 (a) -4 (b) 16 (c) 8 (d) 0
- (18) $\lim_{x \rightarrow 5} \frac{x^4 - 625}{x^2 - 25} = \dots\dots\dots$
 (a) 25 (b) 1 (c) 125 (d) 50
- (19) $\lim_{x \rightarrow 0} \frac{(x+2)^3 - 8}{x} = \dots\dots\dots$
 (a) 8 (b) 0 (c) 12 (d) 16
- (20) $\lim_{x \rightarrow 0} \frac{2x + \sin 3x}{\tan 5x} = \dots\dots\dots$
 (a) 5 (b) 1 (c) $\frac{6}{5}$ (d) 0
- (21) If the function $f : f(x) = \begin{cases} \frac{x^3 - 27}{x - 3} & , x \neq 3 \\ 3k & , x = 3 \end{cases}$ is continuous at $x = 3$, then $k = \dots\dots\dots$
 (a) zero (b) 3 (c) 6 (d) 9
- (22) In $\triangle ABC$, if $m(\angle A) = 30^\circ$, $m(\angle C) = 60^\circ$, $c = 15\sqrt{3}$, then $a = \dots\dots\dots$
 (a) 30 (b) 45 (c) 15 (d) 60
- (23) In $\triangle ABC$, if $\frac{\sin A}{3} = \frac{2 \sin B}{5} = \frac{\sin C}{4}$, then $a : b : c = \dots\dots\dots$
 (a) $8 : 5 : 6$ (b) $6 : 5 : 8$ (c) $7 : 2 : 4$ (d) $3 : 4 : 5$
- (24) The measure of the largest angle in a triangle whose side lengths are 3 cm., 5 cm. and 7 cm. is $\dots\dots\dots^\circ$
 (a) 110 (b) 150 (c) 100 (d) 120

(25) The number of possible solutions of ΔABC in which $m(\angle A) = 42^\circ$, $b = 10$ cm, $a = 8$ cm. is

- (a) zero (b) 1 (c) 2 (d) infinite number.

(26) If r is the length of the radius of the circumcircle of the triangle XYZ

, then $\frac{y}{2 \sin Y} = \dots\dots\dots$

- (a) r (b) $\frac{1}{2} r$ (c) $2 r$ (d) $4 r$

(27) In ΔXYZ , $y^2 + z^2 - x^2 = 2 y z \times \dots\dots\dots$

- (a) $\cos X$ (b) $\cos Z$ (c) $\sin Z$ (d) $\sin X$

Second Essay questions

Answer the following questions :

1 Draw the curve of the function f where $f(x) = (x-2)^2 + 1$, $x \in \mathbb{R}$

From graph : (1) Determine the range. (2) Discuss the monotony of the function.

2 Find : $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x^2 - 5x + 6}$

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First Multiple choice questions

Choose the correct answer from the given ones :

(1) If $f(x) = \frac{1}{x}$, $g(x) = \sqrt{x}$, then the domain of $(f \circ g)$ is

- (a) $[0, \infty[$ (b) $\mathbb{R} - \{0\}$ (c) $\mathbb{R}$ (d) $\mathbb{R}^+$

(2) If $f(x) = \sqrt[3]{x}$, $g(x) = x^3$, then $(f \circ g)(x) = \dots\dots\dots$

- (a) x (b) x^3 (c) $\sqrt[3]{x}$ (d) $|x|$

(3) The function which is one-to-one from the function defined by the following rules is

- (a) $f_1(x) = x^2$ (b) $f_2(x) = |x-1|$ (c) $f_3(x) = \frac{1}{x}$ (d) $f_4(x) = 3$

(4) If f is an odd function, $a \in$ the domain of f , then $f(a) + f(-a) = \dots\dots\dots$

- (a) zero (b) $2f(a)$ (c) $2a$ (d) $f(a)$

(5) The function $f : f(x) = |x|$ is increasing on the interval

- (a) $]0, \infty[$ (b) $]-\infty, 0[$ (c) $]-\infty, \infty[$ (d) $]-\infty, 0]$

(6) The curve of the function $f : f(x) = x^3 - 3$ is the same curve of the function $g : g(x) = x^3$ by a translation of magnitude 3 units in the direction of

- (a) $\overrightarrow{OX}$ (b) $\overrightarrow{O\tilde{X}}$ (c) $\overrightarrow{Oy}$ (d) $\overrightarrow{O\tilde{y}}$

(7) The solution set of the equation : $x^{\frac{2}{3}} = 25$ in $\mathbb{R}$ is

- (a) $\{5\}$ (b) $\{125, -125\}$ (c) $\{125\}$ (d) $\{5, -5\}$

(8) The exponential function $f : f(x) = a^x$, $a > 1$, its curve approaches

- (a) the x -axis (positive direction) (b) the x -axis (negative direction)
(c) the y -axis (positive direction) (d) the y -axis (negative direction)

(9) If $7^{x+1} = 3^{2x+2}$, then $x = \dots\dots\dots$

- (a) -1 (b) zero (c) 4 (d) 1

(10) If f is a function where $f(x) = x + 2$, then $f^{-1}(x) = \dots\dots\dots$

- (a) $x + 2$ (b) $-x + 2$ (c) $x - 2$ (d) $\frac{x}{2}$

(11) If $\log(x + 11) = 2$, then $x = \dots\dots\dots$

- (a) -9 (b) 22 (c) 89 (d) 91

(12) $\log_2 5 \times \log_5 2 = \dots\dots\dots$

- (a) 1 (b) 10 (c) $\log_2 10$ (d) $\log_5 10$

(13) If $3^x = 5$, then $x = \dots\dots\dots$

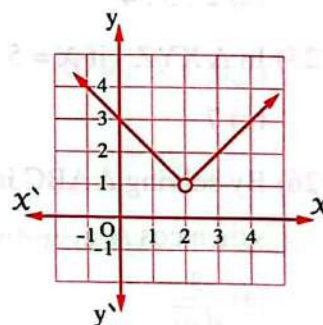
- (a) 3 (b) $\log_3 5$ (c) $\log_5 3$ (d) $\frac{5}{3}$

(14) The opposite graph represents

the curve of the function f

, then $\lim_{x \rightarrow 2} f(x) = \dots\dots\dots$

- (a) -1 (b) 1
(c) 2 (d) does not exist.



(15) $\lim_{x \rightarrow 3} \frac{x^3 - 27}{x^2 - 9} = \dots\dots\dots$

- (a) $\frac{3}{2}$ (b) 3 (c) $4\frac{1}{2}$ (d) 27

(16) $\lim_{x \rightarrow 2} \frac{x^2 + x - 6}{x^2 - 4} = \dots\dots\dots$

- (a) $\frac{4}{5}$ (b) $\frac{5}{4}$ (c) $\frac{2}{5}$ (d) $-\frac{2}{5}$

(17) $\lim_{x \rightarrow \infty} \frac{\sqrt{x^2 + 3}}{2x + 1} = \dots\dots\dots$

- (a) $\frac{1}{2}$ (b) $\frac{3}{2}$ (c) 1 (d) 3

- (18) $\lim_{x \rightarrow \infty} \frac{x^{-2} + 3}{x^{-3} + 6} = \dots\dots\dots$
 (a) $\frac{1}{2}$ (b) 2 (c) 3 (d) 6
- (19) $\lim_{x \rightarrow 0} \frac{2x + \sin 3x}{5x + \tan 2x} = \dots\dots\dots$
 (a) 1 (b) $\frac{5}{7}$ (c) $\frac{7}{5}$ (d) -1
- (20) $\lim_{x \rightarrow 0} \frac{12 - 12 \cos x}{x} = \dots\dots\dots$
 (a) 12 (b) zero (c) 1 (d) 24
- (21) If $f(x) = \begin{cases} x^2 + 2, & x < 3 \\ 3x + 1, & x \geq 3 \end{cases}$, then $\lim_{x \rightarrow 3} f(x) = \dots\dots\dots$
 (a) -10 (b) 7 (c) 10 (d) does not exist.
- (22) In $\triangle ABC$, if $m(\angle A) = 30^\circ$, $m(\angle C) = 60^\circ$, $c = 15\sqrt{3}$ cm.
 , then $a = \dots\dots\dots$ cm.
 (a) 15 (b) 30 (c) 45 (d) 60
- (23) In triangle ABC, $m(\angle A) = 45^\circ$, the length of the radius of its circumcircle = 6 cm.
 , then $a = \dots\dots\dots$ cm.
 (a) 13 (b) $6\sqrt{2}$ (c) 12 (d) $\sqrt{2}$
- (24) In $\triangle XYZ$, if $3 \sin X = 4 \sin Y = 2 \sin Z$, then $x : y : z = \dots\dots\dots$
 (a) 2 : 3 : 4 (b) 6 : 4 : 3 (c) 3 : 4 : 6 (d) 4 : 3 : 6
- (25) In $\triangle XYZ$, if $x = 5$ cm, $y = 3$ cm, $m(\angle Z) = \frac{2}{3}\pi$, then $z = \dots\dots\dots$ cm.
 (a) 7 (b) 8 (c) 9 (d) 4
- (26) By solving $\triangle ABC$ in which $a = 2$ cm, $b = 4\sqrt{2}$ cm, $c = 2\sqrt{5}$ cm.
 , then $\cos A = \dots\dots\dots$
 (a) $\frac{3}{\sqrt{10}}$ (b) $\frac{4}{5}$ (c) $\frac{2}{\sqrt{10}}$ (d) $\frac{\sqrt{10}}{5}$
- (27) The number of possible solutions of $\triangle ABC$ in which $m(\angle A) = 100^\circ$, $b = 15$ cm.
 and $a = 12$ cm. is $\dots\dots\dots$
 (a) zero (b) 1 (c) 2 (d) 3

Second

Essay questions

Answer the following questions :

- 1 Find algebraically in $\mathbb{R}$ the solution set of the inequality : $|2x - 5| \leq 9$

- 2 Discuss the continuity of the function f where $f(x) = \begin{cases} x & , x \leq 1 \\ x+1 & , x > 1 \end{cases}$ at $x = 1$

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El-Menia Governorate



Matay Zone

First

Multiple choice questions

Choose the correct answer from those given :

- (1) In ΔXYZ , $m(\angle Y) = 30^\circ$, $y = 6$ cm., then the length of radius (r) = cm.
 (a) 6 (b) 12 (c) 24 (d) 3
- (2) In ΔABC , if $3 \sin A = 4 \sin B = 6 \sin C$, then $a : b : c =$
 (a) 2 : 3 : 4 (b) 4 : 3 : 2 (c) 3 : 2 : 4 (d) 6 : 4 : 3
- (3) ΔABC in which $a = b = 5$ cm., $c = 6$ cm., then $\cos A =$
 (a) 0.4 (b) 0.6 (c) 0.16 (d) 2.4
- (4) If ΔABC has two solutions and $m(\angle A) = 30^\circ$, $b = 16$ cm., then $a =$ cm.
 (a) 6 (b) 8 (c) 12 (d) 20
- (5) $\log x - \log 3 = \log 9$, then $x =$
 (a) 3 (b) 4 (c) 9 (d) 27
- (6) $\log 2 = x$, $\log 3 = y$, then $\log 6 =$
 (a) $x + y$ (b) xy (c) $x - y$ (d) $\log x + \log y$
- (7) $\lim_{x \rightarrow \infty} (5x^{70} + 8x^{30} + 4) =$
 (a) 0 (b) 4 (c) 19 (d) ∞
- (8) The curve of the function $f(x) = x^2 + 9$ is the same curve of the function $g(x) = x^2$ by translation unit in direction of $\overrightarrow{OY}$
 (a) 9 (b) 3 (c) -3 (d) -9
- (9) If $3^{x-1} = 81$, then $x =$
 (a) 3 (b) 4 (c) 5 (d) 9
- (10) If $f(x) = ax^3 + b$ is an odd function and $f(3) = 27$, then $a + b =$
 (a) 1 (b) 27 (c) 0 (d) 30
- (11) If $x \in [-1, 3]$, then $|2x - 2| \leq$
 (a) 2 (b) 3 (c) 4 (d) 5

- (12) If the function $f^{-1}(x) = \{(1, 2), (4, k)\}$ and its inverse function f where $f(x) = \{(3, 4), (n, 1)\}$, then $n + k = \dots\dots\dots$
- (a) 6 (b) 5 (c) 1 (d) 22
- (13) $\log_3 2 = A$, $\log_5 3 = B$, then $A \times B = \dots\dots\dots$
- (a) $\log_5 2$ (b) $\log_2 5$ (c) $\log_3 10$ (d) $\log 5$
- (14) $\lim_{x \rightarrow 4} (2x + \sqrt{x}) = \dots\dots\dots$
- (a) 4 (b) 6 (c) 8 (d) 10
- (15) $\sqrt[3]{5} \times \sqrt[3]{2} = \sqrt[6]{x}$, then $x = \dots\dots\dots$
- (a) 500 (b) 108 (c) 72 (d) 100
- (16) $\frac{3^x + 2^x + 1}{5^x + 10^x + 15^x} = \frac{1}{25}$, then $x = \dots\dots\dots$
- (a) 1 (b) 2 (c) -1 (d) -2
- (17) $f : f(x) = \begin{cases} 2x & , x \leq 3 \\ x^2 & , x > 3 \end{cases}$, then $f(-3) + f(1) + f(5) = \dots\dots\dots$
- (a) 3 (b) 5 (c) 18 (d) 21
- (18) The domain of function $f(x) = \frac{x+1}{\sqrt{x-1}+3}$ is $\dots\dots\dots$
- (a) $]1, \infty[$ (b) $[1, \infty[$ (c) $]-\infty, 3]$ (d) $]-\infty, 1]$
- (19) $\lim_{x \rightarrow 3} \frac{x^5 - 243}{x - 3} = \dots\dots\dots$
- (a) 115 (b) 405 (c) 45 (d) 500
- (20) $\lim_{x \rightarrow 0} \frac{5x + 3 \sin x}{\tan 8x} = \dots\dots\dots$
- (a) $\frac{5}{8}$ (b) $\frac{3}{8}$ (c) 1 (d) 8
- (21) $\lim_{x \rightarrow -1} \frac{x^3 - x^2}{x^3 + 1} = \dots\dots\dots$
- (a) 0 (b) -1 (c) not exist (d) $\frac{1}{3}$
- (22) Measure of greatest angle in the triangle whose side lengths 7 cm., 5 cm., 3 cm. = $\dots\dots\dots^\circ$
- (a) 120 (b) 150 (c) 60 (d) 30
- (23) $\lim_{x \rightarrow 1} \frac{x^2 - 1}{x - 1} = \dots\dots\dots$
- (a) 2 (b) -1 (c) 1 (d) undefined.

(24) $f(x) = \begin{cases} \frac{\sin^2 2x}{x^2} & , x < 0 \\ 5a - 6 \cos x & , x > 0 \end{cases}$ and $\lim_{x \rightarrow 0} f(x)$ is exist , then $a = \dots\dots\dots$

- (a) 2 (b) 5 (c) 8 (d) 10

(25) The solution set of the equation : $4^x + 2^{x+1} = 8$ in $\mathbb{R}$ is $\dots\dots\dots$

- (a) $\{1\}$ (b) $\{-1\}$ (c) $\{1, -1\}$ (d) $\emptyset$

(26) ΔXYZ is an equilateral triangle of side length = $14\sqrt{3}$ cm. , then length of diameter of circumcircle = $\dots\dots\dots$

- (a) 7 (b) 14 (c) 28 (d) 21

(27) $\lim_{x \rightarrow 1} (3 - x) = \dots\dots\dots$

- (a) 1 (b) 2 (c) 4 (d) -2

Second Essay questions

Answer the following questions :

1 Represent the function $f(x) = (x-2)^3 + 1$ graphically , then from the graph find the domain , its type if it is even , odd or otherwise

2 If $f(x) = \begin{cases} ax - 2 & , -4 \leq x \leq 3 \\ x^2 + b & , 3 < x < 5 \\ 6x - 1 & , 5 \leq x < 7 \end{cases}$ is continuous function on $x \in [-4, 7]$

Find the value of a and b

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Qena Governorate



Maths Inspection

First Multiple choice questions

Choose the correct answer from those given :

(1) $\lim_{x \rightarrow 0} \frac{x^2 + x}{x} = \dots\dots\dots$

- (a) not exist (b) zero (c) 2 (d) 1

(2) The S.S. of the equation : $|x-2| + 3 = 1$ in $\mathbb{R}$ is $\dots\dots\dots$

- (a) $[-2, 2]$ (b) $\emptyset$ (c) $\mathbb{R}$ (d) $[-1, 1]$

(3) In ΔABC , $a = 5$ cm. , $b = 8$ cm. , $m(\angle C) = 60^\circ$, then $c = \dots\dots\dots$

- (a) 4 cm. (b) 7 cm. (c) 8 cm. (d) 9 cm.

- (4) The one-to-one function is
- (a) $f(x) = x - 3$ (b) $f(x) = 2x^2$ (c) $f(x) = |x + 2|$ (d) $f(x) = 4$
- (5) $\lim_{x \rightarrow -3} \frac{(x+2)^3 + 1}{x+3} = \dots\dots\dots$
- (a) 3 (b) 6 (c) -3 (d) 8
- (6) If $\log_2 x = 3$, then $\log_x 8 = \dots\dots\dots$
- (a) 2 (b) 1 (c) 3 (d) 4
- (7) In ΔXYZ , if $\sin X = 2 \sin Y$, $X = 6$ cm., then $y = \dots\dots\dots$ cm.
- (a) 6 (b) 2 (c) 12 (d) 3
- (8) The S.S. of the inequality : $|2x - 1| < 3$ is
- (a) $[-1, 2]$ (b) $] -1, 2[$ (c) $\mathbb{R} -] -1, 2[$ (d) $\mathbb{R} - [-1, 2]$
- (9) In ΔABC , $2 \sin A \sin B = 3 \sin B \sin C = 4 \sin C \sin A$, then $a : b : c = \dots\dots\dots$
- (a) $3 : 4 : 2$ (b) $4 : 3 : 2$ (c) $6 : 4 : 3$ (d) $2 : 3 : 4$
- (10) If $f(x) = \begin{cases} x+3, & x < 2 \\ x^2-1, & x > 2 \end{cases}$, then $(f \circ f)(1) = \dots\dots\dots$
- (a) 15 (b) 4 (c) zero (d) 3
- (11) $\lim_{x \rightarrow 3} \frac{x-3}{x^2+9} = \dots\dots\dots$
- (a) not exist (b) zero (c) $\frac{1}{6}$ (d) $-\frac{1}{3}$
- (12) The function $f(x) = (x-1)^3 + 2$ is increasing in the interval
- (a) $] -\infty, 1]$ (b) $[2, \infty[$ (c) $[1, \infty[$ (d) $] -\infty, \infty[$
- (13) $\lim_{x \rightarrow \infty} \frac{(a-3)x^2 + bx + 7}{2x+1} = 3$, then $a + b = \dots\dots\dots$
- (a) 7 (b) 9 (c) 6 (d) 3
- (14) If $4^{x-3} = 7^{6-2x}$, then $x + 2 = \dots\dots\dots$
- (a) -1 (b) 5 (c) 3 (d) 2
- (15) The number of solutions of triangle ABC where $m(\angle A) = 150^\circ$, $a = 12$ cm., $b = 15$ cm. is
- (a) 1 (b) 2 (c) zero (d) infinite number of triangles.
- (16) If $(3)^x = 2$, then $(9)^{x+1} = \dots\dots\dots$
- (a) 9 (b) 27 (c) 18 (d) 36
- (17) $\lim_{x \rightarrow 0} \frac{4x(\cos x + \cos 2x + \cos 3x)}{\sin 2x} = \dots\dots\dots$
- (a) zero (b) not exist. (c) 6 (d) 12

- (18) The range of the function $f(x) = (x - 1)^2$ is
- (a) $]-\infty, 1]$ (b) $[0, \infty[$ (c) $[1, \infty[$ (d) $[-1, \infty[$
- (19) $\lim_{x \rightarrow \frac{\pi}{2}} \frac{\sin x}{x} = \dots\dots\dots$
- (a) zero (b) $\frac{2}{\pi}$ (c) $\frac{\pi}{2}$ (d) 1
- (20) The domain of the function $f(x) = \log x^2$ is
- (a) $x > 0$ (b) $x > 1$ (c) $\mathbb{R}$ (d) $\mathbb{R} - \{0\}$
- (21) In $\triangle ABC$, $\sin A + \sin B + \sin C = 2.4$, and its perimeter = 24 cm., then the circumference of the circle passing through the vertices of $\triangle ABC = \dots\dots\dots \pi$ cm.
- (a) 20 (b) 10 (c) 5 (d) 25
- (22) If $(5)^{x-4} = \log_c 7 \times \log_7 c$, then $x = \dots\dots\dots$
- (a) 4 (b) 1 (c) 5 (d) 11
- (23) $\lim_{x \rightarrow 3} \frac{\sqrt{x+1} - 2}{x-3} = \dots\dots\dots$
- (a) not exist (b) zero (c) 4 (d) $\frac{1}{4}$
- (24) If $x = \log 2$, $y = \log 3$, then $\log 12 = \dots\dots\dots$
- (a) $2x + y$ (b) $6x + y$ (c) $x^2 + y^2$ (d) $6xy$
- (25) $\lim_{x \rightarrow \infty} (6 + 4x^{-2} - 2x^{-1}) = \dots\dots\dots$
- (a) ∞ (b) 8 (c) 6 (d) -2
- (26) If $\log_3 x \times \log_5 3 = 2$, then $x = \dots\dots\dots$
- (a) 1 (b) 25 (c) 125 (d) 8
- (27) In $\triangle ABC$, $m(\angle A) = 40^\circ$, $m(\angle B) = 60^\circ$, then the greatest side in length is
- (a) a (b) b (c) c (d) bc

Second

Essay questions

Answer the following questions :

- 1 Draw the curve of the function $f(x) = |x - 2| + 1$, then from the graph find the range, the monotony, its type if it is even, odd or otherwise.
- 2 Find the value of (c) that makes the function :

$$f(x) = \begin{cases} \frac{(x+1)^9 - 1}{x} & , x < 0 \\ 3x + c & , x \geq 0 \end{cases} \text{ is continuous at } x = 0$$

حمل الآن

مجاناً وحصرياً

امتحانات رقم (3)

الترم الاول



1

Cairo Governorate

El-Nozha Educational Zone
Mathematics Supervision**First Multiple choice questions**Interactive
test ①

Choose the correct answer from those given :

- (1) If $f(2) = 4$, $g(4) = 3$, then $(g \circ f)(2) = \dots\dots\dots$
 (a) 12 (b) 4 (c) 3 (d) 1
- (2) If $f : f(x) = x^2 + ax + 9$ is even function, then $a = \dots\dots\dots$
 (a) zero (b) 3 (c) 6 (d) -6
- (3) The solution set in $\mathbb{R}$ of the inequality $|x - 1| \geq 3$ is $\dots\dots\dots$
 (a) $]-2, 4[$ (b) $[-2, 4]$ (c) $\mathbb{R} -]-2, 4[$ (d) $\mathbb{R} - [-2, 4]$
- (4) In ΔABC : $m(\angle A) = 45^\circ$, and the length of the radius of the circle passing through its vertices = 6 cm., then $a = \dots\dots\dots$ cm.
 (a) 13 (b) $6\sqrt{2}$ (c) 12 (d) $\sqrt{2}$
- (5) $\lim_{x \rightarrow 4} \frac{x^2 - 16}{x - 4} = \dots\dots\dots$
 (a) zero (b) 4 (c) 16 (d) 8
- (6) The exponential form of the relation $\log_3 y = x$ is $\dots\dots\dots$
 (a) $y = x^3$ (b) $x = y^3$ (c) $y = 3^x$ (d) $x = 3^y$
- (7) The vertex point of the curve of the function $f : f(x) = (3 - x)^2 + 2$ is $\dots\dots\dots$
 (a) $(-3, -2)$ (b) $(3, 2)$ (c) $(-3, 2)$ (d) $(3, -2)$
- (8) The solution set of the equation : $\sqrt{x^2 + 6x + 9} = 5$ in $\mathbb{R}$ is $\dots\dots\dots$
 (a) $\{2\}$ (b) $\{-8\}$ (c) $\{-8, 2\}$ (d) $\emptyset$
- (9) $\lim_{x \rightarrow 2} \frac{x^5 - 32}{x^3 - 8} = \dots\dots\dots$
 (a) 4 (b) $\frac{5}{3}$ (c) zero (d) $6\frac{2}{3}$
- (10) In ΔXYZ , if $x = y$, then $\cos X = \dots\dots\dots$
 (a) $\frac{z}{2y}$ (b) $\frac{2y}{z}$ (c) $\frac{2z}{x}$ (d) $\frac{y}{2x}$
- (11) If $x^{\frac{3}{4}} = 27$, then $x = \dots\dots\dots$
 (a) 3 (b) 9 (c) 27 (d) 81

- (12) $\lim_{x \rightarrow \infty} \frac{2x-5}{3x-7} = \dots\dots\dots$
 (a) $\frac{2}{3}$ (b) $\frac{5}{7}$ (c) $\frac{3}{2}$ (d) $\frac{7}{5}$
- (13) The range of $f : f(x) = \frac{1}{x-2} + 1$ is $\dots\dots\dots$
 (a) $\mathbb{R} - \{1\}$ (b) $\mathbb{R} - \{2\}$ (c) $\mathbb{R} - \{-2\}$ (d) $[2, \infty[$
- (14) The solution set of the equation $\log_2 x = \log_4 25$ equal $\dots\dots\dots$
 (a) $\{2\}$ (b) $\{5\}$ (c) $\{1, 5\}$ (d) $\{4\}$
- (15) $\lim_{x \rightarrow 0} \frac{\sin 3x}{x} = \dots\dots\dots$
 (a) 1 (b) $\frac{1}{3}$ (c) 3 (d) -3
- (16) If $f(x) = 3^{x-2}$, then the solution set of equation $f(x-1) = 81$ is $\dots\dots\dots$
 (a) $\{7\}$ (b) $\{5\}$ (c) $\{4\}$ (d) $\{3\}$
- (17) $\lim_{x \rightarrow 0} \frac{\sin^2 2x + \tan^2 2x}{3x^2} = \dots\dots\dots$
 (a) $\frac{2}{3}$ (b) 2 (c) $2\frac{2}{3}$ (d) $\frac{1}{3}$
- (18) All the functions defined by the following rules are one to one except $\dots\dots\dots$
 (a) $f(x) = x + 2$ (b) $f(x) = x^2, x > 0$
 (c) $f(x) = |x|$ (d) $f(x) = \frac{3x-5}{x-2}$
- (19) If $f(x) = 2x - 6$, then its inverse function $f^{-1}(x) = \dots\dots\dots$
 (a) $2x + 6$ (b) $x + 3$ (c) $2x + 3$ (d) $\frac{1}{2}x + 3$
- (20) In $\triangle ABC : c = 7 \text{ cm.}, m(\angle A) = 70^\circ, m(\angle B) = 40^\circ$, then $b \approx \dots\dots\dots \text{ cm.}$
 (a) 6.3 (b) 7.93 (c) 3.6 (d) 4.8
- (21) $\lim_{x \rightarrow \infty} \left(\frac{5}{7}\right)^{\frac{1}{x}} = \dots\dots\dots$
 (a) 1 (b) -1 (c) $\frac{3}{5}$ (d) ∞
- (22) If $3^{x+1} + 3^{x-1} = 90$, then $x = \dots\dots\dots$
 (a) 9 (b) 27 (c) 3 (d) 10
- (23) $\lim_{x \rightarrow 0} 3x \csc 2x = \dots\dots\dots$
 (a) 6 (b) $1\frac{1}{2}$ (c) $\frac{2}{3}$ (d) not available.
- (24) The radius length of the circumcircle of an equilateral triangle whose side length is $20\sqrt{3} \text{ cm.} = \dots\dots\dots$
 (a) 5 (b) 10 (c) 20 (d) 40

- (25) If $\log_2 3 \times \log_3 4 \times \log_4 5 \times \dots \times \log_n (n+1) = 10$, then $n = \dots\dots\dots$
 (a) 9 (b) 10 (c) 11 (d) 1023
- (26) $\lim_{x \rightarrow 3} \frac{\sqrt{x+1}-2}{x-3} = \dots\dots\dots$
 (a) 4 (b) $\frac{1}{4}$ (c) 6 (d) $\frac{1}{6}$
- (27) The measure of the largest angle in a triangle whose side lengths are 3 cm., 5 cm. and 7 cm. is $\dots\dots\dots^\circ$
 (a) 110 (b) 150 (c) 100 (d) 120

Second Essay questions

Answer the following questions :

- 1 Draw the curve of the function : $f(x) = |x-2| + 3$, explain from the drawing the range of the function, discuss its monotony and determine its type if it is even, odd or otherwise.

- 2 Discuss the existence of $\lim_{x \rightarrow 4} f(x)$ where $f(x) = \begin{cases} \frac{x^2 - 5x + 4}{x - 4} & , x > 4 \\ 2x - 5 & , x < 4 \end{cases}$

2

Cairo Governorate



Shoubra Educational Zone
Mathematics Supervision

First Multiple choice questions

Choose the correct answer from the given ones :

- (1) If $f(x) = x - 3$, $g(x) = x^2$, then $(f \circ g)(5) = \dots\dots\dots$
 (a) 2 (b) 4 (c) 22 (d) 25
- (2) If $f(x) = 3^x$, then $f(a) \times f(b) = \dots\dots\dots$
 (a) $f(a \cdot b)$ (b) $f(a + b)$ (c) $a \cdot b$ (d) $a + b$
- (3) If f is an even function and $7f(x) - 4f(-x) = 9$, then $f(x) = \dots\dots\dots$
 (a) -5 (b) 9 (c) 5 (d) 3
- (4) If $\log_3 15 = x$, $\log_2 5 = y$, then $\dots\dots\dots$
 (a) $3^{x-1} = 2^y$ (b) $3x = 2y$ (c) $x^3 = y^2$ (d) $x = y$
- (5) $\log(\cos \theta) + \log(\sec \theta) = \dots\dots\dots$ where $\theta \in [0, \frac{\pi}{2}[$
 (a) -1 (b) 0 (c) 1 (d) 2



Interactive
test (2)

- (6) If $\lim_{x \rightarrow a} \frac{x^5 - a^5}{x^4 - a^4} = 1$, then $a = \dots\dots\dots$
 (a) $\frac{4}{5}$ (b) $\frac{5}{4}$ (c) 4 (d) 5
- (7) $\lim_{x \rightarrow 0} \frac{\sin 3x}{\tan \frac{1}{3}x} = \dots\dots\dots$
 (a) $\frac{1}{2}$ (b) 1 (c) 3 (d) 9
- (8) The number of triangle which satisfy : $m(\angle A) = 50^\circ$, $a = 4$ cm. , $b = 7$ cm. equals $\dots\dots\dots$
 (a) 0 (b) 1 (c) 2 (d) ∞
- (9) If ΔABC is an equilateral triangle its perimeter = $18\sqrt{3}$ cm. , then the radius length of its circumcircle = $\dots\dots\dots$ cm.
 (a) 12 (b) $6\sqrt{3}$ (c) 6 (d) 3
- (10) If $\log_5 x = 3$, then $\log_5 \left(\frac{x}{5}\right) = \dots\dots\dots$
 (a) 3 (b) 2 (c) 125 (d) 25
- (11) The function $f(x) = 3 - |x - 1|$ is increasing on $\dots\dots\dots$
 (a) $]3, \infty[$ (b) $]-\infty, 3[$ (c) $]1, \infty[$ (d) $]-\infty, 1[$
- (12) The solution set of the inequality : $|x + 3| + 2 < 1$ in $\mathbb{R}$ is $\dots\dots\dots$
 (a) $[-4, -2]$ (b) $]-4, -2[$ (c) $\emptyset$ (d) $\{-4, -2\}$
- (13) $\log_b a^2 \times \log_c b \times \log_d c \times \log_a d = \dots\dots\dots$
 (a) 2 (b) 3 (c) 4 (d) 5
- (14) $\lim_{x \rightarrow 0} (3a^2) = \dots\dots\dots$
 (a) 0 (b) $3a^2$ (c) 1 (d) 3
- (15) $\lim_{x \rightarrow 16} \frac{\sqrt{x} - 1}{x - 16} = \dots\dots\dots$
 (a) $\frac{1}{2}$ (b) 1 (c) doesn't exist (d) 0
- (16) $\lim_{x \rightarrow \infty} \frac{\sqrt[3]{5}}{10} = \dots\dots\dots$
 (a) $-\infty$ (b) ∞ (c) $\frac{1}{2}$ (d) $\frac{1}{10}$
- (17) In ΔABC : if $a = b$, then $\cos A = \dots\dots\dots$
 (a) $\frac{2c}{b}$ (b) $\frac{c}{2b}$ (c) $\frac{2b}{a}$ (d) $\frac{2b}{c}$
- (18) In ΔABC : $a : b : c = 3 : 2 : 2$, then $\cos A = \dots\dots\dots$
 (a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) $-\frac{1}{8}$ (d) $\frac{3}{4}$

(19) In the opposite figure :

The shown curve represents the function

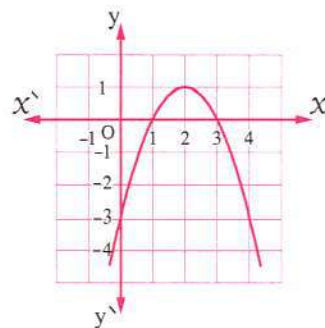
$f(x) = \dots\dots\dots$

(a) $1 - (x - 2)^2$

(b) $2 - (x - 1)^2$

(c) $(x - 2)^2 + 1$

(d) $(x - 1)^2 + 2$



(20) If $\log_x 25 = 2$, then $x^3 + x^2 - x = \dots\dots\dots$

(a) 105

(b) 95

(c) 155

(d) 145

(21) The solution set of the equation : $\log_x 4x = 3$ is $\dots\dots\dots$

(a) $\{0, 2\}$

(b) $\{0, -2\}$

(c) $\{2\}$

(d) $\{0, 2, -2\}$

(22) If $5^x = 2$, then $5^{x+2} = \dots\dots\dots$

(a) 25

(b) 50

(c) 4

(d) 10

(23) $\lim_{x \rightarrow 3} \frac{x^2 - x - 6}{x^2 + x - 12} = \dots\dots\dots$

(a) -1

(b) -5

(c) $\frac{1}{7}$

(d) $\frac{5}{7}$

(24) $\lim_{x \rightarrow 5} \frac{x^2 - 5x}{\sqrt{x+4} - 3} = \dots\dots\dots$

(a) 30

(b) 25

(c) 6

(d) 5

(25) $\lim_{x \rightarrow 0} \frac{(x+1)^2 - 1}{x} = \dots\dots\dots$

(a) -4

(b) 4

(c) -3

(d) -2

(26) In $\triangle ABC$ if $AB = AC = 8$ cm. , $m(\angle A) = 120^\circ$, then the radius length of its circumcircle = $\dots\dots\dots$ cm.

(a) 8

(b) 16

(c) 4

(d) $4\sqrt{3}$

(27) In $\triangle ABC$: $\cos A = \dots\dots\dots$

(a) $\cos B - \cos C$

(b) $\cos(B + C)$

(c) $-(\cos B + \cos C)$

(d) $-\cos(B + C)$

Second

Essay questions

Answer the following questions :

1 Find the solution set of the equation : $2|2 - x| + 3\sqrt{x^2 - 4x + 4} = 15$ in $\mathbb{R}$

2 Discuss the continuity of the function f in $\mathbb{R}$ where : $f(x) = \begin{cases} \frac{\sin(x-1)}{x-1} & , x > 1 \\ -\cos \pi x & , x \leq 1 \end{cases}$



First Multiple choice questions



Interactive
test ③

Choose the correct answer from those given :

- (1) ABC is right-angled triangle at B and $b = 12$ cm. , then $\frac{a}{\sin A} + \frac{c}{\sin C} = \dots\dots\dots$ cm.
 (a) 6 (b) 12 (c) 24 (d) 36
- (2) If $2^x = 5$, then $x = \dots\dots\dots$
 (a) $\log_2 5$ (b) $\log_5 2$ (c) $\log \frac{5}{2}$ (d) $\log_2 10$
- (3) In ΔABC , $a = 5$ cm. , $b = 3$ cm. and $m(\angle C) = 120^\circ$, then the perimeter of $\Delta ABC = \dots\dots\dots$ cm.
 (a) 7 (b) 15 (c) 13 (d) 11
- (4) If $\lim_{x \rightarrow 1} \left(\frac{x^2 + 3x - 4}{x + a} \right) = 5$, then $a = \dots\dots\dots$
 (a) 7 (b) -1 (c) 4 (d) 2
- (5) If $\sqrt[3]{2} \times \sqrt[3]{2} = \sqrt[6]{a}$, then $a = \dots\dots\dots$
 (a) 16 (b) 24 (c) 32 (d) 64
- (6) $\lim_{x \rightarrow \infty} (1 + x - x^2) = \dots\dots\dots$
 (a) zero (b) ∞ (c) 1 (d) $-\infty$
- (7) If $f(x) = 3x - 1$, then $(f \circ f)(1) = \dots\dots\dots$
 (a) 2 (b) 3 (c) 4 (d) 5
- (8) If the function f is even , $f(2) = c$, $f(-2) = 6 - c$, then $c = \dots\dots\dots$
 (a) 1 (b) 2 (c) 3 (d) 6
- (9) If $1 < x < 5$, which of them is true ?
 (a) $|x| > 2$ (b) $|x| < 2$ (c) $|x - 3| < 2$ (d) $|x - 3| > 2$
- (10) The solution set of the equation in $\mathbb{R}$: $x - 15 = 2\sqrt{x}$ is $\dots\dots\dots$
 (a) $\{25\}$ (b) $\{9\}$ (c) $\{25, 9\}$ (d) $\{5, 3\}$
- (11) If the function is continuous in $\mathbb{R}$, $\lim_{x \rightarrow 1^+} f(x) = L$ and $\lim_{x \rightarrow 1^-} f(x) = M$, then $(L - M)^2 = \dots\dots\dots$
 (a) zero (b) LM (c) $2L$ (d) 1
- (12) The triangle XYZ in which $x = y$, then $z^2 = \dots\dots\dots (1 - \cos z)$
 (a) y (b) $2y$ (c) y^2 (d) $2y^2$

(13) If $\log_x 25 = 2$, then $x = \dots\dots\dots$

- (a) -5 (b) 5 (c) ± 5 (d) $\pm\sqrt{5}$

(14) The triangle ABC in which $\frac{3a}{\sin A} = 18$ cm., then the area of circumcircle of $\Delta ABC = \dots\dots\dots \text{cm}^2$

- (a) 3π (b) 6π (c) 9π (d) 18π

(15) If the function $f(x) = 2x - k$ and $(1, 3) \in f^{-1}$, then $k = \dots\dots\dots$

- (a) -1 (b) 5 (c) 4 (d) 7

(16) $\lim_{x \rightarrow 2} \frac{\sin(x-2)}{3x-6} = \dots\dots\dots$

- (a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) $\frac{1}{4}$ (d) $\frac{2}{3}$

(17) The number of cows in a cattle farm is 80 cows and the production rate of these cows is 18 % annually, then the number of cows after 4 years is $\dots\dots\dots$ cows.

- (a) 125 (b) 135 (c) 145 (d) 155

(18) $\lim_{x \rightarrow a} \frac{x^3 - a^3}{x - a} = 12$, then $a = \dots\dots\dots$

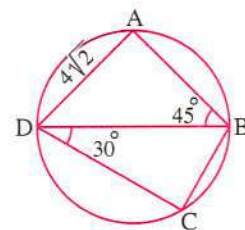
- (a) ± 2 (b) ± 4 (c) 2 (d) -2

(19) In the opposite figure :

If $AD = 4\sqrt{2}$ cm.

, then $BC = \dots\dots\dots$ cm.

- (a) 2 (b) 4
(c) $4\sqrt{2}$ (d) 8



(20) If ΔABC , $(c)^2 = (a+b)^2 - ab$, then $m(\angle C) = \dots\dots\dots^\circ$

- (a) 30 (b) 45 (c) 60 (d) 120

(21) If $\lim_{x \rightarrow \infty} \frac{kx+5}{2x-3} = 4$, then $k = \dots\dots\dots$

- (a) 8 (b) 6 (c) 4 (d) 10

(22) If the function $f(x) = (a-1)^x$ is exponential function, then $\dots\dots\dots$

- (a) $a \in \mathbb{R}^+ - \{1\}$ (b) $a \in \mathbb{R}^+ - \{2\}$
(c) $a \in \mathbb{R}^+$ (d) $a \in]1, \infty[- \{2\}$

(23) $\lim_{x \rightarrow 0} [x \csc(2x)] = \dots\dots\dots$

- (a) 1 (b) 2 (c) $\frac{1}{2}$ (d) -1

- (24) If $f(x) = \begin{cases} x^2 + 1 & , x > 2 \\ 3x - 1 & , x \leq 2 \end{cases}$, then $\lim_{x \rightarrow 2} f(x) = \dots\dots\dots$
 (a) 2 (b) 3 (c) 5 (d) not exist
- (25) The solution set of the inequality : $\frac{1}{|x|} \geq \frac{1}{2}$ in $\mathbb{R}$ is $\dots\dots\dots$
 (a) $[-2, 2]$ (b) $[-2, 2] - \{0\}$ (c) $\mathbb{R} -]-2, 2[$ (d) $\emptyset$
- (26) The solution set of the equation : $2|x| - 3 = |x|$ in $\mathbb{R}$ is $\dots\dots\dots$
 (a) 3 (b) $\emptyset$ (c) -3 (d) ± 3
- (27) If $2^x = 3^y = 5^z$, then $\frac{x}{y} + \frac{x}{z} = \dots\dots\dots$
 (a) $\log_3 15$ (b) $\log_3 15$ (c) $\log_5 15$ (d) $\log_2 15$

Second Essay questions

Answer the following questions :

- 1 The solution set of the equation : $5x - 2|x| = 21$ in $\mathbb{R}$

- 2 If $f(x) = \begin{cases} \sqrt{x+3} - 2 & , x \neq 1 \\ a & , x = 1 \end{cases}$ continuous at $x = 1$ find the value of a

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Giza Governorate



Mathematics Inspection

First Multiple choice questions

Choose the correct answer from those given :

- (1) The sum of roots of the equation : $x^4 = 16$ equals $\dots\dots\dots$
 (a) 2 (b) -2 (c) zero (d) ± 2
- (2) If L, M are the roots of the equation : $3x^2 - 16x + 12 = 0$, then $\log_2 L + \log_2 M = \dots\dots\dots$
 (a) 2 (b) 4 (c) 12 (d) 16
- (3) If $y = \sqrt[5]{x}$, then its inverse function is $y = \dots\dots\dots$
 (a) $\frac{1}{5}x^5$ (b) x^5 (c) $x^5 - 1$ (d) $5x^5$
- (4) The domain of the function $f(x) = \frac{\sqrt{x-2}}{x-3}$ is $\dots\dots\dots$
 (a) $[2, \infty[- \{3\}$ (b) $[2, \infty[$ (c) $\{3\}$ (d) $\mathbb{R}$
- (5) The vertex of the curve of : $f(x) = (2 - x)^2 + 3$ is $\dots\dots\dots$
 (a) (2, 3) (b) (2, -3) (c) (-2, 3) (d) (-2, -3)



Interactive test 4

- (6) If $3^a = 4^b$, then $(9)^{\frac{a}{b}} + (16)^{\frac{b}{a}} = \dots\dots\dots$
- (a) 7 (b) 12 (c) 20 (d) 25
- (7) If $f(x) = 4x - 5$, $g(x) = 3^x$, then $(f \circ g)(2) = \dots\dots\dots$
- (a) 32 (b) 9 (c) 27 (d) 31
- (8) The solution set of the inequality : $|x - 1| < -2$ is $\dots\dots\dots$
- (a) $]-1, 3[$ (b) $\mathbb{R} - [-1, 3]$ (c) $\emptyset$ (d) $]-2, 2[$
- (9) If f is an even and $f(x) + x^2 f(-x) = 3$, then $f(2) = \dots\dots\dots$
- (a) 5 (b) $\frac{3}{4}$ (c) $\frac{3}{5}$ (d) 2
- (10) In $\triangle ABC$, if $a = 4$ cm., $b = 5$ cm., $\cos C = \frac{2}{5}$, then $c = \dots\dots\dots$ cm.
- (a) 4 (b) 5 (c) 2.5 (d) 8
- (11) In $\triangle XYZ$, if $2m(\angle X) = 3m(\angle Y) = 6m(\angle Z)$, $X = 8$ cm., then $z = \dots\dots\dots$ cm.
- (a) 8 (b) 16 (c) 4 (d) 5
- (12) ABC is a triangle drawn in the unit circle, then $\frac{a}{\sin A} = \dots\dots\dots$
- (a) 1 (b) 2 (c) 2π (d) 3
- (13) The solution set of $\log_b(x+5) = \log_b x + \log_b 5$ in $\mathbb{R}$ is $\dots\dots\dots$
- (a) $\{5\}$ (b) $\{4\}$ (c) $\{\frac{5}{4}\}$ (d) $\{\frac{4}{5}\}$
- (14) In $\triangle ABC$, if $b^2 = a^2 + c^2 - ac$, then $m(\angle B) = \dots\dots\dots^\circ$
- (a) 45 (b) 30 (c) 60 (d) 90
- (15) If r is the radius of circumcircle of a triangle, then $a + 2r \sin B + c = \dots\dots\dots$
- (a) circumference of circle. (b) area of circle.
(c) perimeter of $\triangle ABC$ (d) area of $\triangle ABC$
- (16) The range of the function $f : f(x) = \frac{x-2}{2-x}$ is $\dots\dots\dots$
- (a) $\mathbb{R}$ (b) $\mathbb{R} - \{2\}$ (c) $\{-1\}$ (d) $\mathbb{R} - \{-2\}$
- (17) If $4^x = 3$, $8^y = 9$, then $\frac{x+y}{x-y} = \dots\dots\dots$
- (a) -7 (b) 7 (c) $\frac{1}{3}$ (d) $\frac{1}{2}$
- (18) The domain of the function $f : f(x) = \log_{x+3} 6 - x$ is $\dots\dots\dots$
- (a) $]-3, 6[$ (b) $[3, 6[$
(c) $]-3, 6[- \{-2\}$ (d) $[3, 6[- \{5\}$

- (19) $\lim_{x \rightarrow 1} \frac{x^{9\frac{1}{2}} - x^{\frac{1}{2}}}{x^{3\frac{1}{2}} - x^{\frac{1}{2}}} = \dots\dots\dots$
 (a) $\frac{19}{7}$ (b) 3 (c) 1 (d) x
- (20) $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2}$ exist, then $a = \dots\dots\dots$
 (a) -1 (b) 1 (c) 2 (d) 4
- (21) $\lim_{x \rightarrow 2} \left(\frac{x^5 - 32}{x + 2} \right) = \dots\dots\dots$
 (a) 0 (b) 80 (c) 32 (d) 2
- (22) The perimeter of $\triangle ABC = 24$ cm. and $\sin A + \sin C = 3 \sin B$, then $b = \dots\dots\dots$ cm.
 (a) 4 (b) 9 (c) 6 (d) 8
- (23) $\lim_{x \rightarrow \infty} \frac{x^{-3} + x^{-2} + 8}{2 - x^{-4} + x^{-3}} = \dots\dots\dots$
 (a) 1 (b) 4 (c) ∞ (d) $-\infty$
- (24) $\lim_{x \rightarrow \pi} \left(\frac{\sin 3x}{x} \right) = \dots\dots\dots$
 (a) 3 (b) 3π (c) π (d) zero
- (25) $\lim_{x \rightarrow 3} \frac{x^2 - 9}{\tan(2x - 6)} = \dots\dots\dots$
 (a) 1 (b) 3 (c) 2 (d) 5
- (26) If $f(x) = \begin{cases} x^2 + 3a & , x > 2 \\ 5x + b & , x \leq 2 \end{cases}$ and $\lim_{x \rightarrow 2} f(x) = 7$, then $a + b = \dots\dots\dots$
 (a) 1 (b) -3 (c) -2 (d) 3
- (27) If $\lim_{x \rightarrow \infty} \frac{3k|x|}{4x + 3} = 6$, then $k = \dots\dots\dots$
 (a) 6 (b) $\frac{3}{4}$ (c) 8 (d) 3

Second Essay questions

Answer the following questions :

- 1 Find the solution set of the following inequality in $\mathbb{R} : \sqrt{9x^2 - 6x + 1} > 7$
- 2 Discuss the continuity of the function f where : $f(x) = \begin{cases} 4x - 1 & , x \leq 1 \\ x^2 + 2 & , x > 1 \end{cases}$ at $x = 1$

**First Multiple choice questions**Interactive
test ⑤

Choose the correct answer from those given :

- (1) The vertex of the curve of the function $f(x) = (x-1)^2 - 2$ is the point
- (a) (1, 2) (b) (-1, 2) (c) (1, -2) (d) (-1, -2)
- (2) $\lim_{x \rightarrow \infty} \frac{2x^2 - 4}{3x - 5x^2 + 6} = \dots\dots\dots$
- (a) $\frac{2}{3}$ (b) $-\frac{2}{5}$ (c) $\frac{2}{5}$ (d) $-\frac{4}{5}$
- (3) If $3^{2x-1} = 27$, then $x = \dots\dots\dots$
- (a) 2 (b) -2 (c) -5 (d) 5
- (4) ABC is a triangle in which $a : b : c = 3 : 4 : 5$, then $m(\angle C) = \dots\dots\dots^\circ$
- (a) 30 (b) 45 (c) 60 (d) 90
- (5) $\lim_{x \rightarrow 0} \frac{3-2x}{\cos 7x} = \dots\dots\dots$
- (a) 1 (b) $\frac{1}{7}$ (c) -2 (d) 3
- (6) The function $f : f(x) = x^2 \sin x$ is function.
- (a) linear (b) neither even nor odd
(c) odd (d) even
- (7) The S.S. of the equation : $\log_x(x+6) = 2$ in $\mathbb{R}$ is
- (a) $\{3, -2\}$ (b) $\{3\}$ (c) $\{3, 1\}$ (d) $\{1, 6\}$
- (8) ABC is a triangle in which $m(\angle B) = 60^\circ$, $m(\angle A) = 40^\circ$ and $b = 8$ cm.
then $c \approx \dots\dots\dots$ cm.
- (a) 9 (b) 8 (c) 7 (d) 6
- (9) The line of symmetry of the function $f(x) = |2x - 2| + 3$ is
- (a) $x = 2$ (b) $x = -2$ (c) $x = 3$ (d) $x = 1$
- (10) $\lim_{x \rightarrow \infty} (x^{-3} - 5x^{-2} + 2) = \dots\dots\dots$
- (a) 2 (b) ∞ (c) $-\infty$ (d) does not exist
- (11) If $f(x) = 2^x$, then the S.S. of the equation : $f(2x) - 6f(x) + 8 = 0$ in $\mathbb{R}$ is
- (a) $\{1\}$ (b) $\{2\}$ (c) $\{1, 2\}$ (d) $\emptyset$

(12) ABC is a triangle in which $\frac{a}{\sin A} = 6$, then the circumference of the circumcircle of the triangle =

- (a) 6π (b) 3π (c) 12π (d) 9π

(13) The S.S. of the inequality : $|2x - 1| \leq 5$ in $\mathbb{R}$ is

- (a) $]-2, 3[$ (b) $\{-2, 3\}$ (c) $\mathbb{R} -]-2, 3[$ (d) $[-2, 3]$

(14) In the opposite figure :

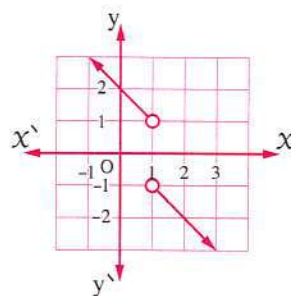
$$\lim_{x \rightarrow 1} f(x) = \dots\dots\dots$$

(a) does not exist.

(b) 1

(c) 2

(d) -1



(15) $\lim_{x \rightarrow 0} \frac{1 - \cos x + \sin x}{1 - \cos x + \tan x} = \dots\dots\dots$

- (a) zero (b) 1 (c) 2 (d) does not exist.

(16) If $f(x) = x + 1$ and $g(x) = x^2$, then $(f \circ g)(2) = \dots\dots\dots$

- (a) 1 (b) 2 (c) 4 (d) 5

(17) ABC is a triangle in which : $a = 3$ cm. , $b = 5$ cm. , $m(\angle C) = 75^\circ$, then the surface area of triangle ABC $\approx \dots\dots\dots$ cm.²

- (a) 6 (b) 7 (c) 8 (d) 9

(18) If $f(x) = 3^{x-2}$, then the S.S. of the equation : $f(x-1) = 81$ in $\mathbb{R}$ is

- (a) $\{7\}$ (b) $\{5\}$ (c) $\{4\}$ (d) $\{3\}$

(19) If $y = x^3$ is the curve of a real function, and g is its image by a translation 2 units to the right, then $g(x) = \dots\dots\dots$

- (a) $(x+2)^3$ (b) $(x-2)^3$ (c) $x^3 + 2$ (d) $x^3 - 2$

(20) $\lim_{h \rightarrow 0} \frac{(x+h)^6 - x^6}{h} = \dots\dots\dots$

- (a) 6 (b) x^5 (c) $6x^5$ (d) does not exist.

(21) In triangle DEF : $e^2 + f^2 - d^2 = 2ef \dots\dots\dots$

- (a) $\cos D$ (b) $\cos E$ (c) $\sin D$ (d) $\cos F$

(22) If $5^{x-3} = 7^{x-3}$, then $x = \dots\dots\dots$

- (a) 5 (b) 7 (c) 3 (d) zero

(23) If $\lim_{x \rightarrow 1} \frac{x^2 + 3x - 4}{x + a} = 5$, then $a = \dots\dots\dots$

- (a) zero (b) -1 (c) 1 (d) 4

- (24) The domain of the function $f(x) = \sqrt{x-5}$ is
 (a) $\mathbb{R}$ (b) $]-5, \infty[$ (c) $]-\infty, 5[$ (d) $[5, \infty[$
- (25) $\lim_{x \rightarrow \infty} \frac{(x^2 + 2x)(6x^3 + 1)}{(x^4 - 1)(2x - 3)} = \dots\dots\dots$
 (a) 1 (b) 3 (c) 6 (d) -5
- (26) In triangle ABC : if $3 \sin A = 2 \sin B = 4 \sin C$, then $a : b : c = \dots\dots\dots$
 (a) 4 : 6 : 3 (b) 3 : 4 : 6 (c) 6 : 4 : 3 (d) 3 : 2 : 4
- (27) $\log_x y \times \log_y z \times \log_z x = \dots\dots\dots$
 (a) xyz (b) $\log 1$ (c) $\log 10$ (d) $x + y + z$

Second Essay questions

Answer the following questions :

- 1 Draw the curve of the function $f(x) = 2 - (x - 1)^2$ and from the graph find its monotony and discuss its type for being even , odd or neither even nor odd.
- 2 If $a \in \mathbb{R}$ and $\lim_{x \rightarrow \infty} \frac{(a+1)x^3 - 6x^2 + 4}{2x^2 + 5x - 1} = -3$, then find the value of a

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Math Inspection

First Multiple choice questions

Choose the correct answer from those given :

- (1) If $f(1) = 3$, $g(3) = 5$, then $(g \circ f)(1) = \dots\dots\dots$
 (a) 3 (b) 5 (c) 15 (d) $\frac{3}{5}$
- (2) If the function $f : f(x)$ in one-to-one function , $f(2k+3) = f(k-1)$, then $k = \dots\dots\dots$
 (a) -1 (b) -2 (c) -3 (d) -4
- (3) If the function f is even in $[c, d]$, then $c + d = \dots\dots\dots$
 (a) $2c$ (b) $2d$ (c) $c - d$ (d) zero
- (4) The solution set of the inequality $|3x - 2| \geq 4$ in $\mathbb{R}$ is
 (a) $\mathbb{R} -]\frac{-2}{3}, 2[$ (b) $]\frac{-2}{3}, 2[$ (c) $\mathbb{R} - [\frac{-2}{3}, 2]$ (d) $[\frac{-2}{3}, 2]$
- (5) The function $f : f(x) = \begin{cases} x^2 & , x > 2 \\ -x^2 & , x \leq 2 \end{cases}$ is decreasing on the interval
 (a) $]0, 2[$ (b) $]-\infty, 0[$ (c) $\mathbb{R} - [0, 2]$ (d) $]0, \infty[$



Interactive test 6

- (6) If $X^{\frac{3}{2}} = 8$, then $X = \dots\dots\dots$
- (a) 2 (b) 4 (c) 8 (d) 9
- (7) If $5^X = 2$, then $(25)^X = \dots\dots\dots$
- (a) 10 (b) 625 (c) 4 (d) 2
- (8) If $f : f(X) = a^X$ is an exponential function, then $a \in \dots\dots\dots$
- (a) $\mathbb{R}$ (b) $\mathbb{R}^+$ (c) $\mathbb{R}^-$ (d) $\mathbb{R}^+ - \{1\}$
- (9) If $f(X) = \sqrt[5]{X}$, then the inverse function $f^{-1}(X) = \dots\dots\dots$
- (a) $\frac{1}{5} X^5$ (b) X^5 (c) $X^5 - 1$ (d) $5 X^5$
- (10) If the function $f = \{(1, 4), (2, -3), (3, 1), (4, 0)\}$, then $f^{-1}(1) + f(2) = \dots\dots\dots$
- (a) -1 (b) zero (c) 1 (d) 3
- (11) The solution set of the equation $\log_X(X+6) = 2$ in $\mathbb{R}$ is $\dots\dots\dots$
- (a) $\{3, -2\}$ (b) $\{3\}$ (c) $\{3, 1\}$ (d) $\{6, 1\}$
- (12) The numerical value of the expression $\frac{\log 64}{\log 8} = \dots\dots\dots$
- (a) 2 (b) 8 (c) 80 (d) 72
- (13) If $3^X = 5$, then $X = \dots\dots\dots$
- (a) 3 (b) $\log_3 5$ (c) $\log_5 3$ (d) $\frac{5}{3}$
- (14) $\lim_{x \rightarrow \infty} \frac{3kx}{4x+3} = 6$, then $k = \dots\dots\dots$
- (a) 6 (b) $\frac{3}{4}$ (c) 8 (d) 3
- (15) $\lim_{x \rightarrow 0} \frac{2x}{\sin 3x} = \dots\dots\dots$
- (a) $\frac{2}{3}$ (b) $\frac{3}{2}$ (c) 6 (d) not exist.
- (16) $\lim_{x \rightarrow 0} \frac{1 - \cos X + \tan 5X}{1 - \cos X - \tan X} = \dots\dots\dots$
- (a) -5 (b) 5 (c) zero (d) undefined
- (17) $\lim_{x \rightarrow 5} \frac{X^2 - 5X}{\sqrt[3]{X+4} - 3} = \dots\dots\dots$
- (a) 30 (b) 6 (c) 5 (d) 25
- (18) $\lim_{x \rightarrow 1} \frac{X^2 - k^2}{X+2} = -1$, then $k = \dots\dots\dots$
- (a) 2 (b) -2 (c) 4 (d) ± 2
- (19) $\lim_{x \rightarrow \infty} \frac{\sqrt[3]{64x^3 + 7x - 2}}{3x+2} = \dots\dots\dots$
- (a) 4 (b) 3 (c) $\frac{2}{3}$ (d) $\frac{4}{3}$

- (20) $\lim_{h \rightarrow 0} \frac{(3h-1)^5 + 1}{5h} = \dots\dots\dots$
 (a) -3 (b) $\frac{3}{5}$ (c) 3 (d) 5
- (21) If the function $f(x) = \begin{cases} 2x & , x \leq 1 \\ 3x - a & , x > 1 \end{cases}$ is continuous at $x = 1$, then $a = \dots\dots\dots$
 (a) 1 (b) 2 (c) -1 (d) -2
- (22) In ΔABC , $m(\angle A) : m(\angle B) : m(\angle C) = 3 : 4 : 3$ if $a = 5$ cm., then the circumference of the circle passing through the vertices of $\Delta ABC \approx \dots\dots\dots$ cm.
 (a) 17 (b) 18 (c) 19 (d) 15
- (23) The number of possible solution of ΔXYZ in which $x = 5$ cm., $y = 6$ cm., $m(\angle X) = 70^\circ$ equals $\dots\dots\dots$
 (a) zero (b) 2 (c) 1 (d) 3
- (24) The perimeter of $\Delta ABC = 33$ cm. and $\sin A + \sin C = \frac{2}{3}$, $\sin B = \frac{1}{4}$, then $b = \dots\dots\dots$
 (a) 6 (b) 9 (c) 12 (d) 15
- (25) In ΔABC , if $4 \sin A = 3 \sin B = 6 \sin C$, then $m(\angle C) \approx \dots\dots\dots$
 (a) 89° (b) 29° (c) 57° (d) 82°
- (26) In ΔABC , $\cos(A+B) = \dots\dots\dots$
 (a) $\frac{a^2 + b^2 - c^2}{2ab}$ (b) $\frac{a^2 + c^2 - b^2}{2ab}$ (c) $\frac{b^2 + c^2 - a^2}{2bc}$ (d) $\frac{c^2 - a^2 - b^2}{2ab}$
- (27) The perimeter of ΔABC in which $b = 11$ cm., $m(\angle A) = 67^\circ$, $m(\angle C) = 46^\circ$ is $\dots\dots\dots$ to nearest cm.
 (a) 22 (b) 38 (c) 31 (d) 27

Second

Essay questions

Answer the following questions :

- 1 Graph the following function : $f(x) = \frac{1}{x-2} + 3$, then determine its domain and range.

- 2 If $f(x) = \begin{cases} \frac{x^2 - 7x + 12}{x-3} & , x > 3 \\ 2x - 7 & , x < 3 \end{cases}$ discuss the existence of $\lim_{x \rightarrow 3} f(x)$

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Mathematics supervision

First

Multiple choice questions



Interactive
test 7

Choose the correct answer from those given :

- (1) The domain of the function $f(x) = \sqrt{5-x}$ is
- (a) $\{5\}$ (b) $\mathbb{R} - \{5\}$ (c) $]5, \infty[$ (d) $]-\infty, 5]$
- (2) The solution set of the inequality : $\sqrt{4x^2 - 12x + 9} \leq 5$ in $\mathbb{R}$ is
- (a) $[-1, 4]$ (b) $[-4, 1]$ (c) $[-1, 4[$ (d) $]-4, 1]$
- (3) If f is an even function , $3f(a) + 2f(-a) = 20$, then $f(a) =$
- (a) 2 (b) 3 (c) 4 (d) 5
- (4) the range of the function $\frac{6x-5}{3x-2} =$
- (a) $\mathbb{R} - \left\{\frac{2}{3}\right\}$ (b) $\mathbb{R} - \{3\}$ (c) $\mathbb{R} - \left\{\frac{5}{6}\right\}$ (d) $\mathbb{R} - \{2\}$
- (5) If $f(x) = 3x - 1$ and $(f+g)(x) = (f \circ g)(x)$, then $g(6) =$
- (a) 3 (b) 6 (c) 9 (d) 12
- (6) The domain of the function $f : f(x) = \log_3(x-5)$ is
- (a) $]-\infty, 5[$ (b) $]-\infty, 5]$ (c) $]5, \infty[$ (d) $]-\infty, 3]$
- (7) If $2^x = 3$, then $8^x =$
- (a) 9 (b) 27 (c) 64 (d) 512
- (8) If $f(x) = 3^x$, then the solution set of the equation : $f(x+2) + f(x) = 90$ is
- (a) $\{1\}$ (b) $\{2\}$ (c) $\{3\}$ (d) $\{4\}$
- (9) If $\log_3(x+1) = 2$, then $x =$
- (a) 5 (b) 6 (c) 7 (d) 8
- (10) If $x^{\frac{3}{5}} = 27$, then $x =$
- (a) 243 (b) 125 (c) 81 (d) 15

(11) In the opposite figure :

$$f(x) = 3^x + 1$$

, then the area of the rectangle

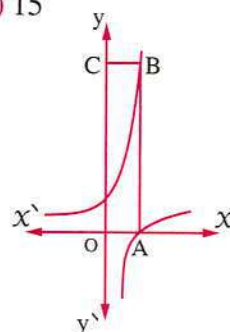
ABCO = area unit.

(a) 12

(b) 18

(c) 20

(d) 24



(12) In the opposite figure :

$\overline{AC}$ is a tangent to the circle M at C

, $A \in \overline{BD}$, $m(\angle B) = 30^\circ$

, $BC = x$ cm. , $DA = y$ cm.

, then $\log_3 \frac{x}{y} = \dots\dots\dots$

- (a) 3 (b) $\frac{1}{3}$ (c) $\frac{1}{2}$ (d) 2

(13) If $5^x \times 2^y = 50$, $2^x \times 5^y = 20$, then $x + y = \dots\dots\dots$

- (a) 2 (b) 3 (c) 5 (d) 6

(14) $\lim_{x \rightarrow \frac{\pi}{4}} \frac{\tan x}{x} = \dots\dots\dots$

- (a) 1 (b) $\frac{\pi}{4}$ (c) $\frac{4}{\pi}$ (d) $\frac{1}{180}$

(15) $\lim_{x \rightarrow -1} \frac{x^9 + 1}{x^7 + 1} = \dots\dots\dots$

- (a) $\frac{9}{7}$ (b) $-\frac{9}{7}$ (c) $\frac{18}{7}$ (d) $-\frac{18}{7}$

(16) $\lim_{x \rightarrow \infty} \frac{2x+3}{\sqrt{25x^2+4}} = \dots\dots\dots$

- (a) $\frac{3}{4}$ (b) $\frac{2}{25}$ (c) $\frac{2}{5}$ (d) $\frac{5}{7}$

(17) If $\lim_{x \rightarrow \infty} \frac{(a-2)x^3 + bx^2 + 5}{3x^2 + 2} = 4$, then $\frac{b}{a} = \dots\dots\dots$

- (a) 4 (b) 6 (c) $\frac{1}{4}$ (d) $\frac{1}{6}$

(18) If $f(x) = \begin{cases} \frac{(x+3)^5 - 243}{5x} & , x \neq 0 \\ 3k & , x = 0 \end{cases}$ is continuous at $x = 0$, then $k = \dots\dots\dots$

- (a) 135 (b) 81 (c) 15 (d) 27

(19) $\lim_{x \rightarrow 0} \frac{x^5 - 32}{x^3 - 8} = \dots\dots\dots$

- (a) $\frac{20}{3}$ (b) 20 (c) 24 (d) 4

(20) $\lim_{x \rightarrow 1} \frac{\sqrt{x+15} - 4}{x^2 - 1} = \dots\dots\dots$

- (a) 4 (b) -4 (c) $\frac{1}{16}$ (d) $\frac{1}{8}$

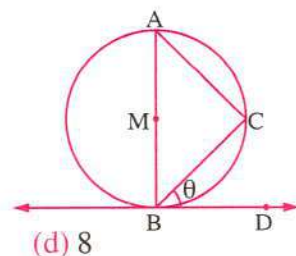
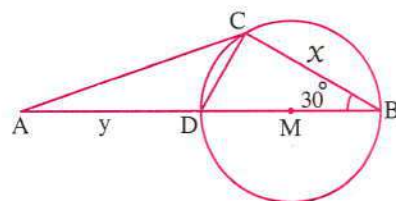
(21) In the opposite figure :

$\overline{AB}$ is a diameter in a circle its radius length 2 cm.

, $\overline{BD}$ is a tangent to the circle at B

, $m(\angle DBC) = \theta^\circ$, then $\lim_{\theta \rightarrow 0} \frac{BC}{\tan 2\theta} = \dots\dots\dots$

- (a) 1 (b) 2 (c) 4



(22) The perimeter of $\triangle ABC$ is 15 cm. and $\sin A + \sin C = 2 \sin B$, then $AC = \dots\dots\dots$ cm.

- (a) 3 (b) 4 (c) 5 (d) 6

(23) In $\triangle ABC$: $AB = 10$ cm. , $AC = 12$ cm. and $\cos (B + C) = \frac{1}{3}$, then the length of $\overline{BC} = \dots\dots\dots$ cm.

- (a) 16 (b) 17 (c) 18 (d) 19

(24) The area of $\triangle ABC$ is 10 cm.^2 and $AB = 5\sqrt{2}$ cm. , $AC = 4$ cm. , then $m(\angle A)$ may be equal $\dots\dots\dots^\circ$

- (a) 15 (b) 30 (c) 45 (d) 60

(25) In $\triangle ABC$: $AB = 6$ cm. , $AC = 14$ cm. , $m(\angle B) = 120^\circ$, then the number of triangles which satisfy these conditions is $\dots\dots\dots$

- (a) 0 (b) 1 (c) 2 (d) 3

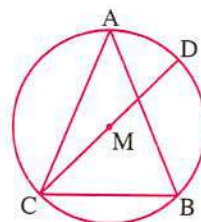
(26) In $\triangle ABC$: $\frac{b^3 - c^3 + a^3}{a^2} = b - c + a$, then $m(\angle A) = \dots\dots\dots$

- (a) 60 (b) 90 (c) 120 (d) 150

(27) In the opposite figure :

$\angle A$ is acute angle , where $\sin A = \frac{1}{3}$
 , $BC = 6$ cm. , then $\cos (\angle DCB) = \dots\dots\dots$

- (a) $\frac{1}{2}$ (b) $\frac{1}{3}$
 (c) $\frac{1}{4}$ (d) $\frac{1}{6}$



Second Essay questions

Answer the following questions :

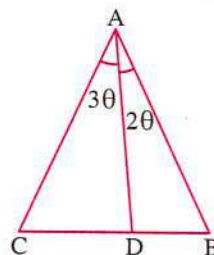
1 Find the solution set of the equation : $|x - 4| + |x - 3| = 5$ algebraically in $\mathbb{R}$

2 In the opposite figure :

In $\triangle ABC$:

$$3 AC = 5 AB$$

Find : $\lim_{\theta \rightarrow 0} \frac{\text{area of } \triangle ACD}{\text{area of } \triangle ABD}$



**First Multiple choice questions**Interactive
test 8

Choose the correct answer from those given :

- (1) The domain of the function $f(x) = \sqrt{x-4}$ is
 (a) $[4, \infty[$ (b) $]-\infty, 4[$ (c) $]4, \infty[$ (d) $]-\infty, 4]$
- (2) If $f(x) = \sqrt{x+5}$, $g(x) = x^2$, then $(f \circ g)(2) = \dots\dots\dots$
 (a) 3 (b) 4 (c) 7 (d) 9
- (3) The function $f(x) = x \cos x$ is
 (a) even. (b) odd.
 (c) neither even nor odd function (d) one-to-one
- (4) The symmetric point of the function $f : f(x) = \frac{1}{x} + 1$ is
 (a) (1, 0) (b) (0, 1) (c) (0, 0) (d) (1, -1)
- (5) The range of the function $f(x) = |x-2| + 1$ is
 (a) $[1, \infty[$ (b) $[2, \infty[$ (c) $]-\infty, 1]$ (d) $[-\infty, 2]$
- (6) The solution set of the equation : $3^{x+1} + 3^x = 12$ in $\mathbb{R}$ is
 (a) $\{0\}$ (b) $\{1\}$ (c) $\{3\}$ (d) $\{0, 1\}$
- (7) The exponential function of base (a) is increasing if
 (a) $a > 0$ (b) $a > 1$ (c) $0 < a < 1$ (d) $a = 1$
- (8) An amount of 5000 pounds is deposited in a bank gives a yearly compound interest 5 % for 7 years = pounds.
 (a) 5350 (b) 6750 (c) 7035.5 (d) 8500
- (9) If $f(x) = x^3 + 7$, then $f^{-1}(-1) = \dots\dots\dots$ {such that $f^{-1}(x)$ is inverse function of $f(x)$ }
 (a) -2 (b) 1 (c) 2 (d) 8
- (10) The solution set of the equation : $\log_x(64x) = 4$ in $\mathbb{R}$ is
 (a) $\{2\}$ (b) $\{4\}$ (c) $\{0, 4\}$ (d) $\{6\}$
- (11) The simplest form of the expression : $\log_b a^2 \times \log_c b^3 \times \log_a c = \dots\dots\dots$
 (a) 1 (b) 2 (c) 3 (d) 6
- (12) The domain of the function $f : f(x) = \log_x(5-x)$ is
 (a) $]0, 5[$ (b) $[0, 5]$ (c) $]-\infty, 5[$ (d) $]0, 5[- \{1\}$

- (13) The value of : $\log_3 \log_2 8 = \dots\dots\dots$
 (a) -2 (b) -1 (c) 1 (d) 4
- (14) $\lim_{x \rightarrow \infty} (3x^{-5} + 4x^{-2} + 5) = \dots\dots\dots$
 (a) zero (b) 5 (c) 12 (d) ∞
- (15) $\lim_{x \rightarrow 0} \frac{2x + \sin 3x}{5x + \tan 2x} = \dots\dots\dots$
 (a) -1 (b) 1 (c) $\frac{5}{7}$ (d) $\frac{7}{5}$
- (16) $\lim_{x \rightarrow 0} \frac{2 - \cos x - \cos 2x}{x} = \dots\dots\dots$
 (a) zero (b) 1 (c) 2 (d) 3
- (17) $\lim_{x \rightarrow 3} \frac{\sqrt{x+1} - 2}{x-3} = \dots\dots\dots$
 (a) $\frac{1}{4}$ (b) 4 (c) $\frac{1}{6}$ (d) 6
- (18) $\lim_{x \rightarrow 4} \frac{(x-2)^2 - 4}{x-4} = \dots\dots\dots$
 (a) 2 (b) 4 (c) 16 (d) not exist
- (19) If the function f is continuous at $x = 2$ where $f(x) = \begin{cases} ax^2 + 5 & , x \leq 2 \\ 9 - bx & , x > 2 \end{cases}$
 , then $2a + b = \dots\dots\dots$
 (a) -2 (b) 2 (c) 7 (d) 14
- (20) If $f(x) = \begin{cases} \frac{\sin^2 2x}{x^2} & , x < 0 \\ 2a + 3 \cos x & , x > 0 \end{cases}$ and $\lim_{x \rightarrow 0} f(x)$ exists , then $a = \dots\dots\dots$
 (a) zero (b) 0.5 (c) 2 (d) -0.5
- (21) The function $f : f(x) = \frac{4}{x^2} + \frac{4}{x^2 - 9}$ is continuous for each $x \in \dots\dots\dots$
 (a) $\mathbb{R}$ (b) $\mathbb{R} - \{0\}$ (c) $\mathbb{R} - \{-3, 3\}$ (d) $\mathbb{R} - \{0, -3, 3\}$
- (22) In ΔABC in which $a = 3.5$ cm. , $m(\angle A) = 30^\circ$, then the circumference of the circle that passes through the vertices of this triangle = $\dots\dots\dots$ cm. $(\pi = \frac{22}{7})$
 (a) 7 (b) 14 (c) 22 (d) 77
- (23) In ΔXYZ , then $2XZ \times \dots\dots\dots = X^2 + Z^2 - Y^2$
 (a) $\cos X$ (b) $\cos Y$ (c) $\cos Z$ (d) $\sin Y$
- (24) In ΔABC if $\sin A : \sin B : \sin C = 3 : 4 : 2$, then $m(\angle C) \approx \dots\dots\dots$ nearest degree.
 (a) 29 (b) 57 (c) 82 (d) 89
- (25) In ΔABC if $m(\angle A) = 60^\circ$, $m(\angle B) = 50^\circ$ and the length of the radius of its circumcircle = 5 cm. , then the area of triangle = $\dots\dots\dots$ nearest cm^2
 (a) 9 (b) 12 (c) 31 (d) 62

- (26) In $\Delta ABC : m(\angle A) + m(\angle B) = 120^\circ$, $a = 2$ cm., $b = 3$ cm. then $c = \dots\dots\dots$ cm.
 (a) 3 (b) 4 (c) $\sqrt{5}$ (d) $\sqrt{7}$
- (27) The number of possible solution of ΔABC in which $a = 2$ cm., $b = 10$ cm., $m(\angle A) = 42^\circ$ is $\dots\dots\dots$
 (a) zero (b) 1 (c) 2 (d) infinite number.

Second Essay questions

Answer the following questions :

- 1 Graph the function $f : f(x) = \frac{12}{|x|+3}$, from the graph, deduce the range and prove that the function is even.
- 2 If $f(x) = \begin{cases} 3x-2 & , x \leq -2 \\ ax+b & , -2 < x < 5 \\ x^2-12 & , x \geq 5 \end{cases}$ is continuous at $x = -2$, $x = 5$, find the value of a and b

9

El-Dakahlia Governorate



Maths Inspection

First Multiple choice questions



Interactive test 9

Choose the correct answer from the given ones :

- (1) In all the following relations, y is function in x except $\dots\dots\dots$
 (a) $y = \cos x$ (b) $y = 2$ (c) $y = x^2 - 1$ (d) $y^2 = x^2 + 1$
- (2) If the domain of function $f : f(x) = \frac{2}{x^2 - 6x + k}$ is $\mathbb{R} - \{3\}$, then $k = \dots\dots\dots$
 (a) 3 (b) 9 (c) ± 9 (d) 18
- (3) If $f(x) = \sqrt{x+5}$, $g(x) = x^2$, then $(f \circ g)(2) = \dots\dots\dots$
 (a) 3 (b) 4 (c) 7 (d) 9
- (4) The odd function from the following function that are defined by the following rules is $\dots\dots\dots$
 (a) $f(x) = x^2 \sin x$ (b) $f(x) = \tan^2 x$ (c) $f(x) = \cos x$ (d) $f(x) = 1$
- (5) If $f(x) = 7$, then the range of the function f is $\dots\dots\dots$
 (a) $\mathbb{R}$ (b) $\mathbb{R}^+$ (c) $\{7\}$ (d) $\mathbb{R} - \{7\}$
- (6) $a^m \times a^m = \dots\dots\dots$
 (a) a^{2m} (b) ma^2 (c) $2a^m$ (d) a^{m^2}

- (7) If $5^X = 2$, then $(25)^X = \dots\dots\dots$
 (a) 2 (b) 4 (c) 10 (d) 625
- (8) In the exponential function $f : f(X) = a^X$, $a > 1$, then $f(X) > 1$ when $X \in \dots\dots\dots$
 (a) $\mathbb{R}$ (b) $\mathbb{R}^+$ (c) $\mathbb{R}^-$ (d) $\mathbb{Z}$
- (9) If f is a function where $f(X) = 7X$, then $f^{-1}(X) = \dots\dots\dots$
 (a) $7X$ (b) $\frac{X}{7}$ (c) $\frac{7}{X}$ (d) $7 - X$
- (10) The form $\log_a X = y$ is equivalent to $\dots\dots\dots$
 (a) $\log_a y = X$ (b) $a^y = X$ (c) $a^X = y$ (d) $y = aX$
- (11) If $\log(X + 11) = 2$, then $X = \dots\dots\dots$
 (a) -9 (b) 22 (c) 89 (d) 91
- (12) If $3^X = 5$, then $X = \dots\dots\dots$
 (a) 3 (b) $\log_3 5$ (c) $\log_5 3$ (d) $\frac{5}{3}$
- (13) $\log_b a \times \log_c b \times \log_a c = \dots\dots\dots$
 (a) zero (b) 1 (c) abc (d) ac
- (14) $\lim_{x \rightarrow 2} (3a^2) = \dots\dots\dots$
 (a) 3 (b) 12 (c) $3a^2$ (d) 6
- (15) $\lim_{x \rightarrow 0} \frac{x^2 - X}{X} = \dots\dots\dots$
 (a) zero (b) -1 (c) 1 (d) Doesn't exist.
- (16) $\lim_{x \rightarrow 0} \frac{\sqrt{x+1} - 1}{X} = \dots\dots\dots$
 (a) zero (b) $\sqrt{2}$ (c) $\frac{1}{2}$ (d) as no existence
- (17) If $\lim_{x \rightarrow 2} \frac{x^2 - 4a}{X - 2}$ exists, then $a = \dots\dots\dots$
 (a) -1 (b) 1 (c) 2 (d) 4
- (18) $\lim_{x \rightarrow 2} \frac{x^5 - 32}{x^3 - 8} = \dots\dots\dots$
 (a) 4 (b) $\frac{5}{3}$ (c) zero (d) $6\frac{2}{3}$
- (19) $\lim_{x \rightarrow \infty} \frac{x^3 + 5}{X(2X^2 + 3)} = \dots\dots\dots$
 (a) $\frac{5}{8}$ (b) 1 (c) $\frac{1}{2}$ (d) $\frac{5}{3}$
- (20) $\lim_{x \rightarrow 0} \frac{\sin 2X \tan 3X}{4X^2} = \dots\dots\dots$
 (a) $\frac{1}{2}$ (b) $\frac{3}{4}$ (c) $\frac{3}{2}$ (d) 6

- (21) If the function $f : f(x) = \begin{cases} \frac{x^2 - 1}{x - 1} & , x \neq 1 \\ 2a & , x = 1 \end{cases}$ is continuous at $x = 1$, then $a = \dots\dots\dots$
- (a) zero (b) 1 (c) 2 (d) 4
- (22) In any triangle XYZ, $z : x = \dots\dots\dots$
- (a) $\sin X : \sin Y$ (b) $\sin Y : \sin Z$ (c) $\sin Z : \sin X$ (d) $\sin Z : \sin Y$
- (23) In $\triangle ABC$, if $\frac{\sin A}{4} = \frac{\sin B}{9} = \frac{\sin C}{7}$, then the greatest angle in measure is $\dots\dots\dots$
- (a) $\angle A$ (b) $\angle B$ (c) $\angle C$ (d) Right
- (24) In $\triangle ABC$, $b = 2$ cm., $c = 2.5$ cm., $\cos A = \frac{2}{5}$, then the type of $\triangle ABC$ is $\dots\dots\dots$
- (a) a right-angled triangle. (b) an isosceles triangle.
(c) an obtuse-angled triangle. (d) a scalene triangle.
- (25) The number of possible solution of $\triangle ABC$ in which $m(\angle C) = 115^\circ$, $c = 12$ cm., $a = 9$ cm. is $\dots\dots\dots$
- (a) zero (b) 1 (c) 2 (d) 3
- (26) $\triangle XYZ$ is an equilateral triangle, the length of its sides is $10\sqrt{3}$ cm., then the length of the diameter of its circumcircle is $\dots\dots\dots$ cm.
- (a) 5 (b) 10 (c) 15 (d) 20
- (27) in $\triangle ABC$, $6a = 4b = 3c$, then the measure of the smallest angle in the triangle is $\dots\dots\dots$
- (a) $57^\circ 28'$ (b) $41^\circ 12'$ (c) $28^\circ 57'$ (d) $36^\circ 52'$

Second Essay questions

Answer the following questions :

- 1 Draw the curve of the function f where $f(x) = x^3$, $x \in \mathbb{R}$, from the graph determine the range and discuss the monotony of the function.
- 2 Find : $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x^2 - 5x + 6}$

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Damietta Governorate



Educational Directorate



Interactive
test 10

First Multiple choice questions

Choose the correct answer from the given ones :

(1) If $f(x) = \sqrt{x+5}$, $g(x) = x^2$, then $(f \circ g)(2) = \dots\dots\dots$

- (a) 7 (b) 3 (c) 4 (d) 9

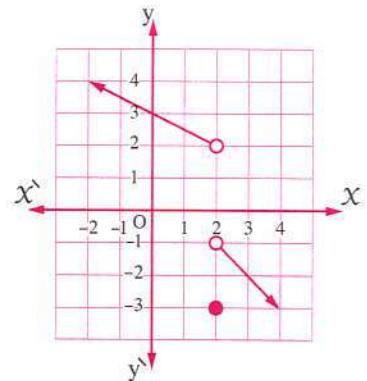
(2) Which of the functions that are defined by the following rules represents an exponential decay function ?

- (a) $f(x) = 2^x$ (b) $f(x) = \left(\frac{1}{3}\right)^{-x}$ (c) $f(x) = 3^x$ (d) $f(x) = \left(\frac{2}{3}\right)^x$

(3) In the opposite figure :

$\lim_{x \rightarrow 2} f(x) = \dots\dots\dots$

- (a) -3
(b) 2
(c) -1
(d) does not exist.



(4) A circle with diameter of length 20 cm. , passes through the vertices of $\triangle ABC$ which is an acute-angled triangle in which $BC = 10$ cm. , then $m(\angle A) = \dots\dots\dots^\circ$

- (a) 30 (b) 60 (c) 45 (d) 150

(5) The function defined by the following rules are one-to-one except

- (a) $f(x) = x^3$ (b) $g(x) = 3x$ (c) $h(x) = \frac{1}{x}$ (d) $n(x) = x^2$

(6) If $2^{x-1} = 7$, then $x \approx \dots\dots\dots$

- (a) 2.81 (b) 3.81 (c) 2.6 (d) 3.6

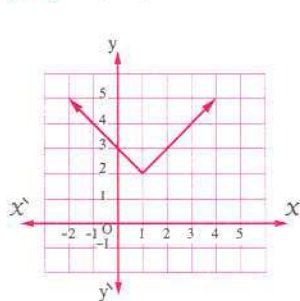
(7) If $\lim_{x \rightarrow 3} \frac{x^2 - 2x + k}{x^2 - 9} = m$, where $m \in \mathbb{R}$, then $k \times m = \dots\dots\dots$

- (a) $\frac{2}{3}$ (b) -3 (c) -2 (d) -1

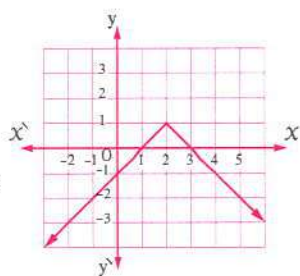
(8) In $\triangle ABC$, $\frac{2b}{\sin B} = \dots\dots\dots r$ (where r is the radius of its circumcircle)

- (a) 1 (b) 2 (c) 4 (d) 8

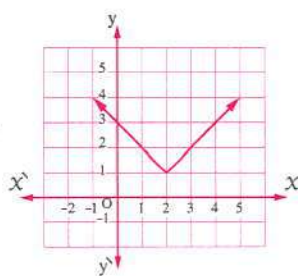
(9) If $f : f(x) = 1 - |x - 2|$, then the figure which represents the function f is



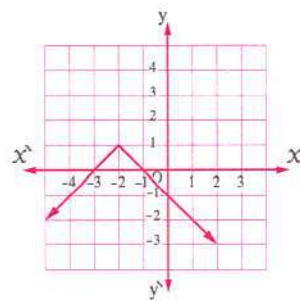
(a)



(b)



(c)



(d)

(10) If $\lim_{x \rightarrow 0} \frac{(a+3)x}{\sin ax} = \frac{2}{5}$, then $a = \dots\dots\dots$

(a) -5

(b) -3

(c) -1

(d) 3

(11) In $\triangle ABC$, $a = 9$ cm., $b = 15$ cm., $m(\angle C) = 106^\circ$, then its perimeter $\approx \dots\dots\dots$ cm.

(a) 44

(b) 42

(c) 34

(d) 28

(12) The range of the function $f : f(x) = x|x|$ is

(a) $\mathbb{R}^+$

(b) $\mathbb{R}^-$

(c) $\mathbb{R}$

(d) $[0, \infty[$

(13) $\lim_{x \rightarrow 16} \frac{\sqrt[4]{x^5 - 32}}{x - 16} = \dots\dots\dots$

(a) 5

(b) $\frac{5}{2}$

(c) $\frac{5}{4}$

(d) $\frac{5}{8}$

(14) The solution set of the equation : $|x| + 3 = 0$ in $\mathbb{R}$ is

(a) $\{-3\}$

(b) $\{3\}$

(c) $\{-3, 3\}$

(d) $\emptyset$

(15) $\log_b a \times \log_c b \times \log_d c \times \log_a d = \dots\dots\dots$

(a) zero

(b) 1

(c) abcd

(d) ad

(16) $\lim_{x \rightarrow 2} \frac{(x+1)^4 - 81}{x - 2} = \dots\dots\dots$

(a) 18

(b) 81

(c) -108

(d) 108

(17) $\lim_{x \rightarrow 0} \frac{1 - \cos \theta}{3x} = \dots\dots\dots$

(a) $\frac{4}{3}$

(b) $\frac{3}{4}$

(c) 1

(d) zero

(18) The number of possible solution of $\triangle ABC$ in which $a = 8$ cm., $b = 10$ cm., $m(\angle A) = 42^\circ$ is

(a) 1

(b) 2

(c) infinite number. (d) zero

(19) The solution set of the equation : $3^x + 3^{3-x} = 12$ in $\mathbb{R}$ is

(a) $\{1, 2\}$

(b) $\{0, 3\}$

(c) $\{3, 4\}$

(d) $\{-3, -4\}$

- (20) If $\log 3 = x$, $\log 4 = y$, then $\log 12 = \dots\dots\dots$
- (a) $x + y$ (b) xy (c) $x - y$ (d) $\log x + \log y$
- (21) If ABC is a triangle in which $a = 4$ cm., $b = 4\sqrt{3}$ cm., $c = 8$ cm., then cosine of the smallest angle equals $\dots\dots\dots$
- (a) $\frac{1}{2}$ (b) $\frac{\sqrt{3}}{2}$ (c) 1 (d) zero
- (22) $\lim_{x \rightarrow \infty} \frac{4ax^n - 4x + 5}{3 - 9x + 8x^2} = 3$, then $a + n = \dots\dots\dots$
- (a) 8 (b) -8 (c) 9 (d) 4
- (23) The straight line $y = 9$ cuts the curve of the function $f : f(x) = 3^x$ at the point $\dots\dots\dots$
- (a) (0, 9) (b) (-2, 9) (c) (2, 9) (d) (1, 9)
- (24) If the function f is continuous at $x = 2$ where $f(x) = \begin{cases} ax^2 + 5 & , \text{ at } x \leq 2 \\ 9 - bx & , \text{ at } x > 2 \end{cases}$, then $2a + b = \dots\dots\dots$
- (a) 7 (b) 14 (c) 2 (d) -2
- (25) If $f(x) = \frac{x+k}{x-1}$ and $(5, 2) \in f^{-1}$, then $k = \dots\dots\dots$
- (a) zero (b) 1 (c) 2 (d) 3
- (26) In ΔABC , if $m(\angle B) = 60^\circ$, $m(\angle C) = 30^\circ$, $c = 4$ cm., then $b = \dots\dots\dots$ cm.
- (a) 4 (b) 8 (c) $2\sqrt{3}$ (d) $4\sqrt{3}$
- (27) The solution set of the inequality $|2x - 3| \geq 13$ in $\mathbb{R}$ is $\dots\dots\dots$
- (a) $]-5, 8[$ (b) $[-5, 8]$ (c) $\mathbb{R} -]-5, 8[$ (d) $\mathbb{R} - [-5, 8]$

Second Essay questions

Answer the following questions :

- 1** Draw the curve of the function $f(x) = \frac{1}{x-2} + 1$, then from the graph :
- (1) Discuss the monotonicity of f
- (2) Determine whether f is even, odd or otherwise.
-
- 2** Redefine (if possible) the function $f : f(x) = \frac{\sqrt{x-1}-2}{x-5}$ to become continuous at $x = 5$



First

Multiple choice questions

Choose the correct answer from the given ones :

- (1) In ΔXYZ , if $3 \sin X = 4 \sin Y = 2 \sin Z$, then $X : y : z = \dots\dots\dots$
 (a) $2 : 3 : 4$ (b) $6 : 4 : 3$ (c) $3 : 4 : 6$ (d) $4 : 3 : 6$
- (2) ABC is an equilateral triangle, its side length equals $8\sqrt{3}$ cm., then the length of the diameter of its circumcircle equals $\dots\dots\dots$ cm.
 (a) 8 (b) $16\sqrt{3}$ (c) 16 (d) $4\sqrt{3}$
- (3) The curve of the function $g : g(X) = |X| - 2$ is the same as the curve of the function $f : f(X) = |X|$ by translation two units in direction of $\dots\dots\dots$
 (a) $\overrightarrow{OX}$ (b) $\overrightarrow{OX}$ (c) $\overrightarrow{OY}$ (d) $\overrightarrow{OY}$
- (4) The point of symmetry of the curve of the function $f : f(X) = \frac{1}{X-3} + 4$ is $\dots\dots\dots$
 (a) $(3, -4)$ (b) $(-3, -4)$ (c) $(3, 4)$ (d) $(-3, 4)$
- (5) The solution set of the inequality : $|2X - 5| \leq 9$ in $\mathbb{R}$ is $\dots\dots\dots$
 (a) $]-\infty, 7[$ (b) $\mathbb{R} - [-2, 7]$ (c) $\mathbb{R} -]-2, 7[$ (d) $[-2, 7]$
- (6) If $X^{\frac{3}{2}} = 64$, then $X = \dots\dots\dots$
 (a) 2 (b) 4 (c) 16 (d) 512
- (7) The exponential function of base a is decreasing if $\dots\dots\dots$
 (a) $a > 0$ (b) $a < 0$ (c) $0 < a < 1$ (d) $-1 < a < 0$
- (8) The solution set of the equation $\log_X (3X - 2) = 2$ in $\mathbb{R}$ is $\dots\dots\dots$
 (a) $\{1, 2\}$ (b) $\{1\}$ (c) $\{2\}$ (d) $\emptyset$
- (9) The expression $\frac{3 \log 2}{\log 4 + \log 3}$ is equivalent to $\dots\dots\dots$
 (a) $\log_3 2$ (b) $\log_7 2$ (c) $\log_{12} 8$ (d) $\log_7 8$
- (10) If $3^{X+5} = \frac{1}{27}$, then $X = \dots\dots\dots$
 (a) -8 (b) -3 (c) 3 (d) 8
- (11) If f is a function where $f(X) = 7X$, then $f^{-1}(X) = \dots\dots\dots$
 (a) $7X$ (b) $\frac{X}{7}$ (c) $\frac{7}{X}$ (d) $7 - X$
- (12) If $7^{X+1} = 3^{2X+2}$, then $5^{X+1} = \dots\dots\dots$
 (a) 2 (b) zero (c) 1 (d) 5

- (13) If the function f^{-1} where $f^{-1} = \{(2, 3), (5, b)\}$ is the inverse function of the function f where $f = \{(4, 5), (a, 2)\}$, then $a - b = \dots\dots\dots$
- (a) -1 (b) zero (c) 1 (d) 2
- (14) If the curve of the polynomial function f intersects the x -axis at $x = 3$, then $\dots\dots\dots$
- (a) $\lim_{x \rightarrow 3} f(x) = 0$ (b) $\lim_{x \rightarrow 0} f(x) = 3$
 (c) $\lim_{x \rightarrow 0} f(x) = 0$ (d) $\lim_{x \rightarrow 3} f(x) = 3$
- (15) $\lim_{x \rightarrow 3} \frac{\sqrt{x+1} - 2}{x-3} = \dots\dots\dots$
- (a) $\frac{1}{6}$ (b) $\frac{1}{4}$ (c) 4 (d) 6
- (16) $\lim_{x \rightarrow \infty} \frac{3x^2}{x(2x-1)} = \dots\dots\dots$
- (a) $\frac{3}{2}$ (b) zero (c) 3 (d) $\frac{2}{3}$
- (17) $\lim_{x \rightarrow 0} \frac{\sin 2x \tan 3x}{4x^2} = \dots\dots\dots$
- (a) $\frac{1}{2}$ (b) $\frac{3}{4}$ (c) $\frac{3}{2}$ (d) 6
- (18) $\lim_{x \rightarrow 0} \frac{1 - \cos x}{3x} = \dots\dots\dots$
- (a) -1 (b) zero (c) 1 (d) does not exist
- (19) If $f(x) = \sqrt[3]{x-2}$, $g(x) = \sqrt{x-4}$, then the domain of $(f \circ g) = \dots\dots\dots$
- (a) $[4, \infty[$ (b) $\mathbb{R}$ (c) $[2, \infty[$ (d) $]4, \infty[$
- (20) The function $f : f(x) = (x-1)^2 + 2$ is increasing on the interval $\dots\dots\dots$
- (a) $\mathbb{R}$ (b) $]1, \infty[$ (c) $] - \infty, 1[$ (d) $] - 1, 1[$
- (21) The number of possible solutions of $\triangle ABC$ in which $m(\angle C) = 115^\circ$, $c = 12$ cm, $a = 8$ cm. is $\dots\dots\dots$
- (a) 1 (b) 2 (c) 3 (d) zero
- (22) If $\triangle XYZ$, $m(\angle Y) = 50^\circ$, $x = 10$ cm. has two solutions, then y could be $\dots\dots\dots$ cm.
- (a) 6 (b) 7.66 (c) 8 (d) 11
- (23) $\lim_{x \rightarrow \infty} \frac{1}{x} \sqrt{8+9x^2} = \dots\dots\dots$
- (a) $2\sqrt{2}$ (b) 3 (c) $-2\sqrt{2}$ (d) -3
- (24) If the function $f : f(x) = \begin{cases} \frac{x^2-1}{x-1} & , \text{ when } x \neq 1 \\ 2a & , \text{ when } x = 1 \end{cases}$ is continuous at $x = 1$, then $a = \dots\dots\dots$
- (a) zero (b) 1 (c) 2 (d) 4

- (25) The measure of the greatest angle in triangle the lengths of its sides are 3 cm. , 5 cm. and 7 cm. equals
- (a) 100° (b) 110° (c) 120° (d) 150°
- (26) In $\triangle ABC$, if $m(\angle A) + m(\angle B) = 120^\circ$, $a = 2$ cm. , $b = 3$ cm. , then $c = \dots\dots\dots$ cm.
- (a) 3 (b) 4 (c) $\sqrt{7}$ (d) $\sqrt{5}$
- (27) If $f(x) = \begin{cases} 3-x & , \text{ when } x < 1 \\ 4 & , \text{ when } x = 1 \\ x^2 + 1 & , \text{ when } x > 1 \end{cases}$, then $\lim_{x \rightarrow 1} f(x) = \dots\dots\dots$
- (a) 1 (b) 2 (c) 4 (d) does not exist

Second Essay questions

Answer the following questions :

1 Find : $\lim_{x \rightarrow -3} \frac{x^4 - 81}{x^5 + 243}$

2 Prove that the function f where $f(x) = x^3 + 2$ is one-to-one function.

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El-Menia Governorate



Bani Mazar Administration
Math Department

First Multiple choice questions

Choose the correct answer from the given ones :

- (1) The odd function of following is $f(x) = \dots\dots\dots$
- (a) $\cos x$ (b) $x \sin x$ (c) 3 (d) $4x$
- (2) In $\triangle ABC$: $2 \sin A = 3 \sin B = 3 \sin C$, then $\cos A = \dots\dots\dots$
- (a) $\frac{1}{8}$ (b) $-\frac{1}{8}$ (c) $\frac{1}{3}$ (d) $-\frac{3}{4}$
- (3) The solution set in $\mathbb{R}$ of the equation : $|x + 2| = x$ is
- (a) $\mathbb{R}$ (b) $\emptyset$ (c) $\{-1\}$ (d) $\{-2\}$
- (4) $\lim_{x \rightarrow 5} \frac{(x+2)^2 - 49}{x-5} = \dots\dots\dots$
- (a) 5 (b) 14 (c) 49 (d) 98
- (5) Solution set of the equation $(2x - 1)^{\frac{3}{2}} = 27$
- (a) $\{-5\}$ (b) $\{4\}$ (c) $\{5\}$ (d) $\{-5, 5\}$
- (6) In $\triangle ABC$ if : $a = c$, $b = 2$ cm. , $\cos A = \frac{2}{5}$, then $a = \dots\dots\dots$
- (a) $\frac{5}{2}$ (b) 2 (c) 3 (d) 4

- (7) The function $f(x) = a^x$ is decreasing on its domain $\mathbb{R}$ when :
- (a) $a > 1$ (b) $a = 1$ (c) $0 < a < 1$ (d) $a = -1$
- (8) $\lim_{x \rightarrow \infty} \frac{x^3 + 5}{x(2x^2 + 3)} = \dots\dots\dots$
- (a) $\frac{5}{8}$ (b) 1 (c) $\frac{1}{2}$ (d) $\frac{5}{3}$
- (9) The solution set of $|x + 1| \leq 3$ in $\mathbb{R}$ is
- (a) $]-2, 4[$ (b) $[-4, 2]$ (c) $\mathbb{R} - [-2, 4]$ (d) $\mathbb{R} -]-4, 2[$
- (10) The measure of greatest angle in triangle whose side lengths are 6 cm. , 10 cm. , 14 cm. =
- (a) 120 (b) 30 (c) 60 (d) 150
- (11) If $\log 0.01 = 3 - x$, then $x = \dots\dots\dots$
- (a) -3 (b) -1 (c) 2 (d) 5
- (12) $\lim_{x \rightarrow -1} \frac{x^8 + x^3}{x^5 - x^3} = \dots\dots\dots$
- (a) $\frac{5}{2}$ (b) $\frac{2}{5}$ (c) $-\frac{2}{5}$ (d) $-\frac{5}{2}$
- (13) In ΔABC if $a = 6$ cm. , $m(\angle A) = 30^\circ$, then the circumference for the circle which passing through vertices of $\Delta ABC = \dots\dots\dots$ cm.
- (a) 6π (b) 12π (c) 24π (d) $3\sqrt{\pi^3}\sqrt{\pi}$
- (14) If $f(x) = 2^{x+2}$ and $f(a) = 8$, then $a = \dots\dots\dots$
- (a) 3 (b) 2 (c) 1 (d) 4
- (15) $\lim_{x \rightarrow \frac{\pi}{4}} \frac{\tan x}{2x} = \dots\dots\dots$
- (a) $\frac{1}{2}$ (b) $\frac{\pi}{2}$ (c) $\frac{4}{\pi}$ (d) $\frac{2}{\pi}$
- (16) The range of the function $f(x) = |x - 2| - 2$ is
- (a) $[-2, \infty[$ (b) $[2, \infty[$ (c) $\mathbb{R}$ (d) $\mathbb{R} - \{2\}$
- (17) In ΔXYZ if : $\frac{x}{2 \sin x} = 8$, then the diameter length of the circle which passing by its vertices =
- (a) 16 (b) 8 (c) 4 (d) 64
- (18) If $\lim_{x \rightarrow \infty} \frac{mx^2 + 7}{2x^2 - 5x} = -2$, then $m = \dots\dots\dots$
- (a) 2 (b) 4 (c) -4 (d) -2
- (19) The solution set of the equation : $\log_x(x + 2) = 2$ in $\mathbb{R}$ is
- (a) $\{-2\}$ (b) $\{2\}$ (c) $\{-1, 2\}$ (d) $\{-2, 2\}$
- (20) If $f(x) = 4^x$ and $f(x + 1) = 64$, then $x = \dots\dots\dots$
- (a) 4 (b) 0 (c) 1 (d) 2

- (21) $\lim_{\frac{1}{x} \rightarrow 0} (x^{-2} + 5x^{-1} - 1) = \dots\dots\dots$
 (a) 8 (b) undefined. (c) -1 (d) 1
- (22) If $f(x) = x^2 - 4$, $g(x) = x - 2$, then $(g \circ f)(1) = \dots\dots\dots$
 (a) 5 (b) 3 (c) -5 (d) -3
- (23) $\lim_{x \rightarrow 3} \frac{\sqrt{x+1} - 2}{x-3} = \dots\dots\dots$
 (a) 2 (b) $\frac{1}{4}$ (c) $\frac{1}{2}$ (d) 4
- (24) $\log_b 25 \times \log_5 b^2 = \dots\dots\dots$ where $b > 1$
 (a) 5b (b) 4 (c) 5 (d) b^2
- (25) If $a = 5$ cm. , $b = 3$ cm. , $\sin C = \frac{3}{5}$, the the area of $\Delta ABC = \dots\dots\dots$ cm.²
 (a) 6 (b) 9 (c) 12 (d) 4.5
- (26) If $3^{x-1} = 4^{1-x}$, then $2^{x+1} = \dots\dots\dots$
 (a) 0 (b) 2 (c) 1 (d) 4
- (27) $\lim_{x \rightarrow \infty} \frac{2x-3}{\sqrt[3]{8x^3-7}} = \dots\dots\dots$
 (a) 1 (b) 2 (c) 0 (d) 4

Second Essay questions

Answer the following questions :

- 1 Graph the curve of function $f : f(x) = (x-1)^2 + 2$, then from the graph find :
 (1) The domain.
 (2) Determine the function is odd , even or otherwise.

- 2 Discuss the continuity of the function $f : f(x) = \begin{cases} \frac{x^2 + 2x - 3}{x-1} , & x < 1 \\ x^2 + 3 , & x \geq 1 \end{cases}$ at $x = 1$

13 Assiut Governorate



Administration of Distinguished and Governmental Language Schools

First Multiple choice questions

Choose the correct answer from the given ones :

- (1) The domain of the function $f : f(x) = \frac{5}{\sqrt{x-4}}$ is
 (a) $[4, \infty[$ (b) $]4, \infty[$ (c) $] -\infty, 4[$ (d) $] -\infty, 4[$
- (2) is $x^{\frac{3}{2}} = 64$, then $x = \dots\dots\dots$
 (a) 512 (b) 16 (c) 4 (d) 2

- (3) Which of the following functions is a one-to-one function ?
- (a) $f(x) = \cos x$ (b) $g(x) = x^2$ (c) $h(x) = x^3$ (d) $k(x) = x^4 + x^2$
- (4) If f is a function where $f(x) = 7x$, then $f^{-1}(x) = \dots$
- (a) $7x$ (b) $\frac{x}{7}$ (c) $\frac{7}{x}$ (d) $7 - x$
- (5) The range of the function $f : f(x) = \frac{x^2 - 1}{x - 1}$ is
- (a) $\mathbb{R}$ (b) $\mathbb{R} - \{-2\}$ (c) $\mathbb{R} - \{2\}$ (d) $\{1\}$
- (6) $\lim_{x \rightarrow 3} \frac{x^2 - x - 6}{x^2 + x - 12} = \dots$
- (a) $\frac{5}{7}$ (b) $\frac{1}{7}$ (c) -1 (d) -5
- (7) The vertex point of the curve of the function $f : f(x) = |x + 3| - 2$ is
- (a) $(3, 2)$ (b) $(-3, -2)$ (c) $(-3, 2)$ (d) $(3, -2)$
- (8) If $\lim_{x \rightarrow a} \frac{x^8 - a^8}{x^6 - a^6} = 48$, then $a = \dots$
- (a) 4 (b) 6 (c) ± 4 (d) ± 6
- (9) If $f(x) = 3x - 1$, $g(x) = x^2$, then $(g \circ f)(-2) = \dots$
- (a) -7 (b) 11 (c) -49 (d) 49
- (10) $\lim_{x \rightarrow 2} \frac{x^3 - 8}{3x^2 - 12} = \dots$
- (a) 1 (b) 2 (c) 0 (d) 3
- (11) The solution set of the inequality $|3 - x| > 0$ is
- (a) $]-3, 3[$ (b) $\mathbb{R} - [-3, 3]$ (c) $\mathbb{R} - \{3\}$ (d) $\mathbb{R}$
- (12) $\lim_{x \rightarrow \infty} \frac{\sqrt[3]{64x^3 + 7x - 2}}{3x + 2} = \dots$
- (a) 4 (b) 3 (c) $\frac{2}{3}$ (d) $\frac{4}{3}$
- (13) The solution set of the equation : $|x + 2| + x = -2$ is
- (a) $\emptyset$ (b) $\mathbb{R}$ (c) $]-\infty, 2[$ (d) $]-\infty, -2]$
- (14) ABC is a triangle in which $a = 23$ cm., $b = 15$ cm. and its perimeter = 70 cm., then measure of the greatest angle in the triangle equals
- (a) $77^\circ 49'$ (b) $113^\circ 2'$ (c) $131^\circ 2'$ (d) 150°
- (15) If $f(x - 1) = 2^{x+1}$, then $f(x) = \dots$
- (a) 2^x (b) 2^{x-1} (c) 2^{x+2} (d) 2^{x-2}
- (16) $\lim_{x \rightarrow 0} \frac{x \sin 2x}{x^2} = \dots$
- (a) 0 (b) 1 (c) 2 (d) 4
- (17) The exponential function of base a is increasing if
- (a) $a > 0$ (b) $a > 1$ (c) $0 < a < 1$ (d) $a = 1$

(18) In triangle ABC , $m(\angle A) = 45^\circ$, the length of the radius of its circumcircle = 6 cm. , then a =

- (a) 13 (b) $6\sqrt{2}$ (c) 12 (d) $\sqrt{2}$

(19) The solution set of the equation : $3^{x+1} + 3^x = 12$ in $\mathbb{R}$ is

- (a) $\{0\}$ (b) $\{3\}$ (c) $\{1\}$ (d) $\{1, 0\}$

(20) If r is the length of the radius of the circumcircle of the triangle XYZ

, then $\frac{y}{2 \sin Y} = \dots\dots\dots$

- (a) r (b) 2 r (c) $\frac{1}{2} r$ (d) 4 r

(21) If $\log_3 (2x + 3) = 2$, then $x = \dots\dots\dots$

- (a) 3 (b) 2 (c) 9 (d) 4

(22) If $f(x) = \begin{cases} 3x - 1 & , x \neq 2 \\ 6 & , x = 2 \end{cases}$, then $\lim_{x \rightarrow 2} f(x) = \dots\dots\dots$

- (a) -5 (b) 5 (c) 6 (d) does not exist.

(23) If $\log_2 x + \log_2 x^2 = 6$, then $x = \dots\dots\dots$

- (a) 2 (b) 4 (c) 6 (d) 216

(24) If the function $f : f(x) = \begin{cases} \frac{x^2 - 9}{x - 3} & , x \neq 3 \\ 2a & , x = 3 \end{cases}$ is continuous at $x = 3$, then a =

- (a) 2 (b) $\frac{3}{2}$ (c) -3 (d) 3

(25) In $\triangle XYZ$, if $x = y$, then $\cos X = \dots\dots\dots$

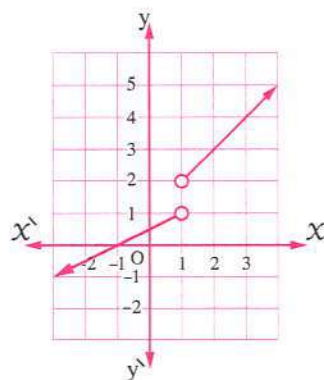
- (a) $\frac{2y^2}{z}$ (b) $\frac{z}{2y}$ (c) $\frac{z}{4x}$ (d) $\frac{y}{2x}$

(26) If the opposite figure represents

the graph of function f

, then $\lim_{x \rightarrow 1} f(x) = \dots\dots\dots$

- (a) 2
(b) 3
(c) 1
(d) does not exist.



(27) By solving the triangle ABC in which a = 5 cm. , b = 7 cm. , $m(\angle C) = 65^\circ$, then c = cm.

- (a) 4.4 (b) 2.1 (c) 6.7 (d) 8.2

Second Essay questions

Answer the following questions :

1 [a] Draw the graph of the function $f : f(x) = x|x|$ and deduce from the graph its range and its type of being odd , even or otherwise.

[b] Find the S.S. of the equation : $\log_x 81 = 4$ in $\mathbb{R}$

2 [a] Find : $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x^2 - 5x + 6}$

[b] Find : $\lim_{x \rightarrow 5} \frac{\sqrt{x-1} - 2}{x-5}$

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Qena Governorate



Directorate of Education

First Multiple choice questions

Choose the correct answer from the given ones :

(1) Solution set of the inequality : $|x + 2| \leq -3$ in $\mathbb{R}$ is

(a) $\mathbb{R}$

(b) $\emptyset$

(c) $[-5, 1]$

(d) $]-5, 1[$

(2) If $f(x) = \begin{cases} \frac{\sqrt{1+x}-1}{x} & , \text{ when } x \neq 0 \\ k & , \text{ when } x = 0 \end{cases}$ continuous at $x = 0$, then $k =$

(a) 0

(b) 2

(c) $\frac{1}{2}$

(d) -1

(3) Domain of the function $f : f(x) = \sqrt{x+2}$ is

(a) $[-2, \infty[$

(b) $[-2, 2]$

(c) $]-\infty, 2]$

(d) $\mathbb{R}$

(4) $\lim_{x \rightarrow 0} \frac{\sin 2x + \tan 3x}{5x} =$

(a) 0

(b) 5

(c) 2

(d) 1

(5) If $\log 2 = x$, $\log 3 = y$, then $\log 6 =$

(a) xy

(b) $x \div y$

(c) $x + y$

(d) x^y

(6) $\lim_{x \rightarrow 2} \frac{2x^2 - x - k}{x^2 - x - 2} = \frac{7}{3}$, then $k =$

(a) 2

(b) 7

(c) -6

(d) 6

(7) $\lim_{x \rightarrow \infty} \frac{5x^{-3} - x^{-1} + 5}{2x^{-3} + 2x^{-1} + 7} =$

(a) $\frac{5}{7}$

(b) $\frac{7}{5}$

(c) $\frac{1}{2}$

(d) $\frac{5}{2}$

- (8) If $5^x = 2$, then $5^{x+2} = \dots\dots\dots$
 (a) 5 (b) 2 (c) 25 (d) 50
- (9) In $\triangle XYZ$ if $x = 5$ cm., $y = 7$ cm., $z = 8$ cm., then $m(\angle Y) = \dots\dots\dots$
 (a) 30° (b) 60° (c) 45° (d) 120°
- (10) Solution set of the equation $(2x + 3)^{\frac{4}{3}} = 81$ in $\mathbb{R}$ is $\dots\dots\dots$
 (a) $\{12, -12\}$ (b) $\{15, -15\}$ (c) $\{15, -15\}$ (d) $\{0\}$
- (11) $\lim_{x \rightarrow 0} \left(\frac{x^2 + 2x}{x} \right) = \dots\dots\dots$
 (a) 2 (b) 1 (c) 0 (d) -2
- (12) $\log_2 7 \times \log_7 2 = \dots\dots\dots$
 (a) 0 (b) 2 (c) 1 (d) 3
- (13) In $\triangle ABC$ if $\frac{\sin A}{3} = \frac{2 \sin B}{5} = \frac{\sin C}{4}$, then $a : b : c = \dots\dots\dots$
 (a) 6 : 5 : 8 (b) 8 : 5 : 6 (c) 7 : 2 : 4 (d) 3 : 5 : 6
- (14) Range of the function $f : f(x) = \left| \frac{1}{x} \right|$ is $\dots\dots\dots$
 (a) $]-\infty, \infty[$ (b) $]0, \infty[$ (c) $[0, \infty[$ (d) $\mathbb{R} - \{0\}$
- (15) The curve of the function $f : f(x) = -2(x-1)^3 + 2$ is symmetric about the point $\dots\dots\dots$
 (a) $(-1, 2)$ (b) $(1, -2)$ (c) $(0, 0)$ (d) $(1, 2)$
- (16) $\lim_{x \rightarrow -3} \frac{x^5 + 243}{x^3 + 27} = \dots\dots\dots$
 (a) 15 (b) -15 (c) 3 (d) $\frac{5}{3}$
- (17) If $\log x \in]0, 1[$, then $x \in \dots\dots\dots$
 (a) $]0, 1[$ (b) $]1, 2[$ (c) $]1, 10[$ (d) $]-\infty, 1[$
- (18) $\lim_{x \rightarrow 3} \sqrt{x-3} = \dots\dots\dots$
 (a) -3 (b) 3 (c) 0 (d) does not exist
- (19) In $\triangle DEF$ if $m(\angle E) = 35^\circ$, $m(\angle F) = 40^\circ$, $EF = 12$ cm.,
 then $DE \approx \dots\dots\dots$ to nearest centimeter.
 (a) 2 (b) 3 (c) 8 (d) $\sqrt{3}$
- (20) In $\triangle ABC$ if $a = 4$ cm., $c = 16$ cm., $m(\angle B) = 115^\circ$, then $b \approx \dots\dots\dots$ cm.
 (a) 326 (b) 18 (c) 20 (d) 16
- (21) If $\log_4 (x^3 - 11) = 2$, then $x = \dots\dots\dots$
 (a) 3 (b) 16 (c) 27 (d) 11

- (22) If f is function where $f(x) = x - 3$, then $f^{-1}(x) = \dots\dots\dots$
 (a) $x + 3$ (b) $-x + 3$ (c) $x - 3$ (d) $\frac{1}{x-3}$
- (23) If r is the radius length of circumcircle of $\triangle XYZ$, then $\frac{x}{4 \sin X} = \dots\dots\dots$
 (a) r (b) $2r$ (c) $\frac{1}{2}r$ (d) $\frac{1}{4}r$
- (24) Function f where $f(x) = a^x$ is increasing on its domain when $\dots\dots\dots$
 (a) $a = 1$ (b) $a > 1$ (c) $a = -1$ (d) $0 < a < 1$
- (25) In $\triangle ABC$ if $a = 7$ cm. , $c = 9$ cm. , $m(\angle B) = 60^\circ$, then number of possible solution of the triangle is $\dots\dots\dots$
 (a) 0 (b) 1 (c) 2 (d) 3
- (26) If $f(x) = 2x + 1$, $(f \circ g)(x) = 3x + 2$, then $g(x) = \dots\dots\dots$
 (a) $x + 1$ (b) $5x + 3$ (c) $\frac{3}{2}x + \frac{1}{2}$ (d) $2x + 3$
- (27) $\lim_{x \rightarrow 0} \frac{(x+2)^5 - 32}{x} = \dots\dots\dots$
 (a) 4 (b) 16 (c) 32 (d) 80

Second Essay questions

Answer the following questions :

- 1 Represent graphically the function $f : f(x) = (x-1)^2 + 2$ from drawing determine range of the function and discuss its monotonicity and show if the function is odd , even or otherwise is the function one-to-one or not ?
-
- 2 If $f(x) = \begin{cases} \frac{\sin^2 2x}{x^2} & , \text{ when } x < 0 \\ 3x + 4 & , \text{ when } x > 0 \end{cases}$ discuss the existence of $\lim_{x \rightarrow 0} f(x)$

كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9

